DV 2000-02

# Report on mineral exploration activities in Québec 1999

Québec

# Report on mineral exploration activities in Québec

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Alain Simard, acting director

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**Cover page :** Photos from the Lac Gayot discovery by Virginia Gold Mines in the Far North of Quebec.

Showing : Lac Gayot
Location : 23M/11
1- Spinifex (Photo by Isabelle Lafrance)
2 and 3- Mineralized zones (Photos from Virginia Gold Mines)

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# Foreword

The 1999 annual report presents the mining exploration activities in each geological province and highlights the mineral potential of the regions of Quebec. Exploration companies have a favorable perception of Quebec's mineral potential, placing the province in second position in the Americas, according to the 1999 Fraser Institute survey.

The Abitibi greenstone belt remains attractive for base and precious metal exploration. In the area lying east of Rouyn-Noranda, exploration work at **Agnico-Eagle Mines'** LaRonde mine has increased the mineral resources to 39.8 Mt at 4.28 % Zn, 0.36 % Cu, 66.9 g/t Ag and 4.3 g/t Au. North of La Sarre, an advanced exploration program of more than $10 M by **Aurizon Mines** on the Casa Bérardi property has defined a mineral resource of 6.9 Mt at 7.41 g/t Au. **Copper Rand Corporation** announced in December 1999 its plan to re-open the Copper Rand mine in Chibougamau and an investment of $22 M to deepen the #4 shaft and sink a ramp to -1,390 m. On the Brosman property, north of Chibougamau, **SOQUEM INC** reports the discovery of a 58 m mineralized zone at a grade of 1 g/t Au. In Matagami, **Noranda**'s Bell Allard mine began production during the summer of 1999 and required an investment of $113 M. Work by **Cancor Mines** on the Gemini property B zone in 1998 confirmed the potential of the zone. A drill hole returned 6.6 % Zn, 0.29 % Cu, 177.5 g/t Ag and 1.33 g/t Au over 10.7m. **Major General Resources** and **Cameco Gold** continued exploration work on the Despinassy property, located 75 km north of Val d'Or. Hole 99-17 intersected 3.1m at 26 g/t Au. On the Windfall Lake property, located some 100 km SW of Chibougamau, **Inmet Mining Corporation**, **Alto Minerals** and **Noront Resources** have discovered numerous mineralized zones. The best values were 65.22 g/t Au over 0.6 m and 41.62 g/t Au over 1.1m. The numerous recent discoveries clearly demonstrate the Abitibi area's mineral potential and the possibility for discoveries within so-called traditional mining camps.

In the James Bay area, **Nuinsco Resources** announced, in January 1999, that hole 99-1 intersected 3.2 m at 10.8 % Ni. A large drilling campaign by **Nuinsco Resources** failed to extend significantly the original mineralized zone. However, several companies remain interested in the numerous new geophysical anomalies ; favorable new contexts should encourage the continuation of work in 2000. In the Eastmain River area, work by **SOQUEM INC** and **Eastmain Resources** on the Clearwater property has led to the discovery of three new veins in 1999, which should substantially increase the geological resources. In the La Grande area, **Cambior** has partnered with **Virginia Gold Mines** on the La Grande South property, where geological resources are estimated at 4,525,000 t at 2.13 g/t Au (March 1999). The discovery of gold-bearing iron formations, gold mineralization associated with major deformation corridors, porphyry-type mineralization and massive sulphide mineralization in the James Bay territory should maintain the level of interest in the area.

In the Far North, **Virginia Gold Mines** announced in November 1999 the discovery of several Ni-Cu-Pt-Pd-Co showings on the Gayot project, located some 100 km north of the Fontages airport and the Trans-Taiga highway. The best values returned were 2.17 % Ni, 0.05 % Co, 0.42 % Cu and 2.46 g/t Pd-Pt over 4.85 m. In the fall of 1999, **Twin Gold** announced the recovery of 112 diamonds from a 212 kg bulk sample taken from the Torngat 1 dyke. This announcement triggered the granting of several mining exploration permits in the area. Finally, geological mapping at 1:250,000, begun in 1998 by Géologie Québec in the Far North, has led to the identification of several new exploration targets in this poorly-known territory.

In the Ungava Trough, **Falconbridge** and **Dumont Nickel** have been active in the exploration for Ni-Cu-PGE deposits found in peridotite horizons, similar to the Raglan mine.

Several interesting metal showings have been found in the Grenville (Mont Laurier, Lac St. Jean and Côte-Nord) and in the Appalachians.

In the industrial minerals sector, the major project is **Noranda**'s Magnola mill at Asbestos in the Eastern Townships. The construction of the mill, with a 63,000 tonnes/year of magnesium capacity, will require an investment of $730 M$. Production should start in June 2000. Three other projects were active in 1999. In the Thetford Mines area, **Ressources Allican** conducted a pre-feasibility study on chrome deposits. In the Deux-Montagnes Seigniory near Montreal, **Niocan** has continued development of its niobium project in the Oka Hill carbonatite Complex. **SOQUEM INC** and **Norsk Hydro** are still studying the possibility of putting the Sept-Îles apatite-ilmenite deposit into production. Finally, we should mention the increased interest for industrial minerals prospecting should be mentioned, particulary from the regional exploration mining funds. More than ten substances have been sought ; mineralizations have been sampled and some have been drilled.

GÉOLOGIE Québec

***M. Alain Simard, acting director***
Direction de la géologie
5700, 4e Avenue Ouest, suite A-208
Charlesbourg (QC) G1H 6R1
Phone: (418) 627-6274
Fax: (418) 643-2816
E-mail: alain.simard@mrn.gouv.qc.ca

***M. Pierre Verpaelst, head of service***
Service géologique de Québec
5700, 4e Avenue Ouest, suite A-210
Charlesbourg (QC) G1H 6R1
Phone: (418) 627-6276
Fax: (418) 643-2816
E-mail: pierre.verpaelst@mrn.gouv.qc.ca

***M. Robert Marquis, head of service***
Service géologique du Nord-Ouest
400, boul. Lamaque, suite 1.2
Val-d'Or (QC) J9P 3L4
Phone: (819) 354-4514, extension 232
Fax: (819) 354-4558
E-mail: robert.marquis@mrn.gouv.qc.ca

***M. Alain Simard, head of service***
Service à la clientèle de l'exploration
et du marketing
5700, 4e Avenue Ouest, suite A-208
Charlesbourg (QC) G1H 6R1
Phone: (418) 627-6274
Fax: (418) 643-2816
E-mail: alain.simard@mrn.gouv.qc.ca

***M. Jean-Marc Charbonneau, head of service***
Service de la géoinformation
5700, 4e Avenue Ouest, suite A-214
Charlesbourg (QC) G1H 6R1
Phone: (418) 627-6269, extension 5219
Fax: (418) 643-2816
E-mail: jean-marc.charbonneau@mrn.gouv.qc.ca

***M. Patrick Rissmann, head of service***
Service des minéraux industriels et
de l'assistance à l'exploration
5700, 4e Avenue Ouest, suite A-206
Charlesbourg (QC) G1H 6R1
Phone: (418) 627-6287, extension 5265
Fax: (418) 643-2816
E-mail: patrick.rissmann@mrn.gouv.qc.ca

**CHIBOUGAMAU**
375, 3e Rue, suite 2
Chibougamau (QC) G8P 1N4
E-mail: manon.dufour@mrn.gouv.qc.ca
Phone: (418) 748-2663
Fax: (418) 748-6061

**MONTRÉAL - EASTERN TOWNSHIPS - LAURENTIANS**
Complexe FTQ
545, boul. Crémazie Est, suite 1110
Montréal (QC) H2M 2V1
E-mail: roch.gaudreau@mrn.gouv.qc.ca
*M. Roch Gaudreau*
Phone: (514) 873-8814
Fax: (514) 873-8983

**ROUYN-NORANDA**
82, boul. Québec
Rouyn-Noranda (QC) J9X 6R1
E-mail: pierre.doucet@mrn.gouv.qc.ca
*M. Pierre Doucet*
Phone: (819) 763-3748
Fax: (819) 763-3798

**LOWER ST LAWRENCE - GASPÉ - MAGDALEN ISLANDS**
124, 1e Avenue Ouest
Sainte-Anne-des-Monts (QC) G0E 2G0
E-mail: bur.mines.ste-anne@mrn.gouv.qc.ca
*M. Serge Lachance*
Phone: (418) 763-3622
Fax: 418 763-2958

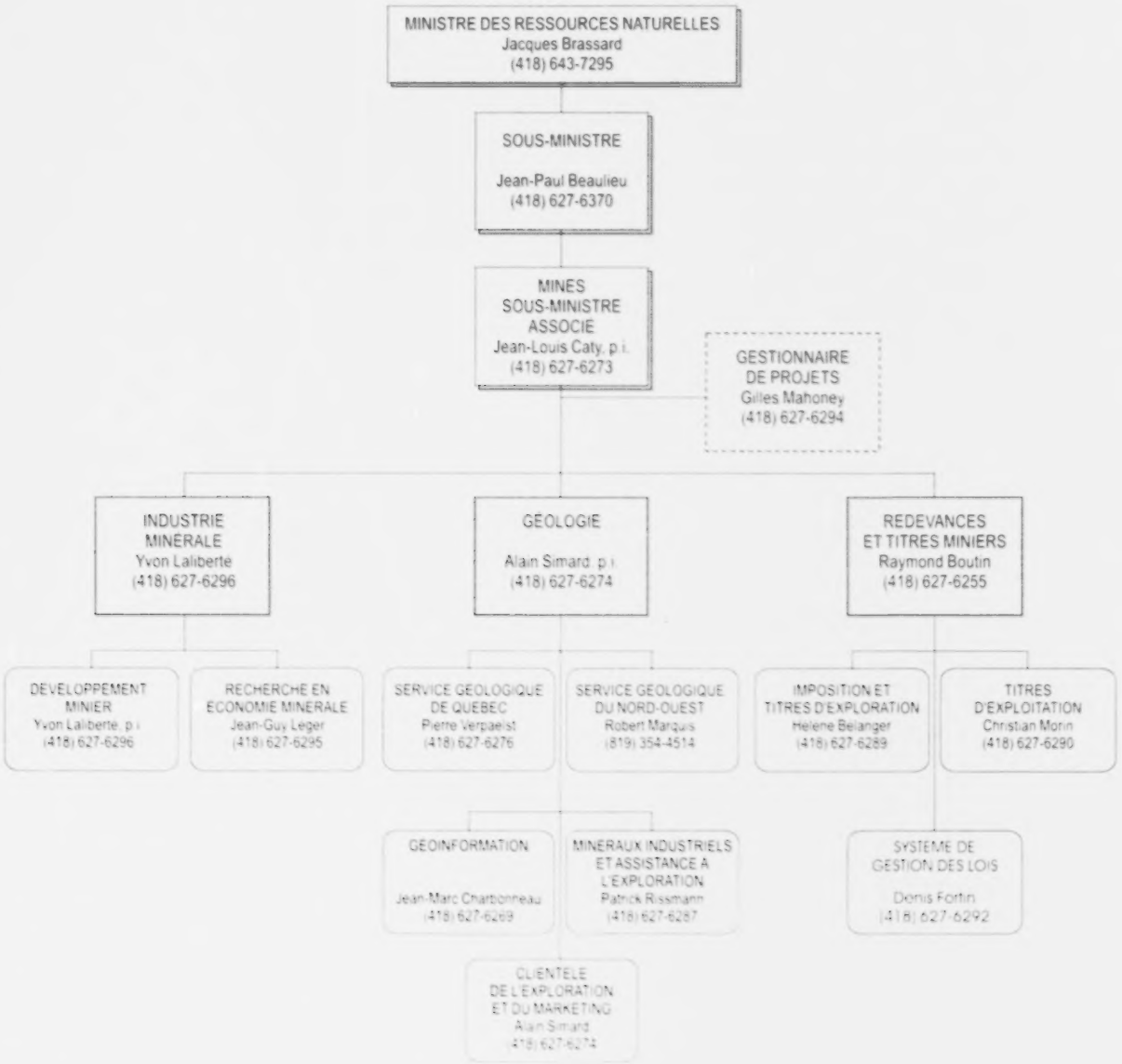
**VAL-D'OR**
400, boul. Lamaque, suite 1.02
Val-d'Or (QC) J9P 3L4
E-mail: chantal.dussault@mrn.gouv.qc.ca
*Mme Chantal Dussault*
Phone: (819) 354-4735, extension 242
Fax: (819) 354-4558

**NORTH SHORE - NEW QUÉBEC**
456, rue Arnaud, suite 1.04
Sept-Îles (QC) G4R 3B1
E-mail: serge.perreault@mrn.gouv.qc.ca
*M. Serge Perreault*
Phone: (418) 964-8300
Fax: (418) 964-8506

**Service outlet Mines-Sherbrooke**
Édifice Yvette-Boucher-Rousseau
200, rue Belvédère Nord, suite 1.05
Sherbrooke (QC) J1H 4A9
E-mail: roch.gaudreau@mrn.gouv.qc.ca
Phone: (819) 820-3190
Fax: (819) 820-3946

**Service outlet Mines-Hull**
170, rue de l'Hôtel-de-Ville
suite 7.340
Hull (QC) J8X 4C2
E-mail: roch.gaudreau@mrn.gouv.qc.ca
Phone: (819) 772-3487
Fax: (819) 772-3958

# MINISTÈRE DES RESSOURCES NATURELLES - SECTEUR DES MINES




Le 16 décembre 1999

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FIGURE 1 – Geological and territorial subdivisions used in this report

# 1A
# North part of the Superior Province (Minto, Bienville and Ashuanipi subprovinces)

Roch Gaudreau

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The Ungava Peninsula covers a vast yet under-explored area (350,000 km²) with an interesting mineral potential and increasingly recognized. Trough its Mid-North Mining Exploration Program, Géologie Québec is planning to complete the mapping at a scale of 1: 250,000 of the entire Minto and Bienville subprovinces.

In 1999, 11 new mining exploration permits (PEM) were recorded. As of December 31, 1999, 49 PEM were active in a region covering 623 km². Twenty-two exploration projects were carried out in 1999 with total expenses of $2.8 M. The distribution of exploration expenses per substance or group of substance is Ni-Cu (Co-PGE), 30 %, Au, 28 %, diamond and uranium, 22 %, Cu-Zn-Au, 15 %, and Cu-Au, 5 %.

## Bienville subprovince

The Bienville subprovince is mainly composed of migmatized orthogneiss with supracrustal and plutonic rock xenoliths.

### FAGNANT BELT

The Fagnant volcano-sedimentary belt is located 60 km southeast of Kuujjuarapik (NTS 33N/02). Band of quartz-magnetite-grunerite iron formation characterize this supracrustal belt. **Virginia Gold Mines** and **Mackenzie Watson Syndicate** (14; figure 1A-1) have discovered a 300 m long gold-bearing zone returning values up to 2.2 g/t Au over 6 m, including 3.4 g/t Au over 3 m.

## Minto subprovince

Tonalitic rocks intruded by voluminous granitoids underlie the Minto subprovince. The granitic and charnockitic complexes are associated with large positive aeromagnetic anomalies (40-100 km wide), while the volcano-sedimentary belts are confined to narrow bands (10-20 km) enclosed within in tonalitic gneiss suites.

### CHARRAS BELT

The Charras belt is located 70 km northwest of the Caniapiscau reservoir (NTS 23M/07) and is mainly composed of komatiitic lavas and ultramafic intrusive rocks. **Ressources Vaujour** has discovered a series of showings (6; figure 1A-1). Trench no. 1 returned values of 4.31 % Cu and 0.93 g/t Au over 1.37 m wide and 12 m long. Trench no. 2, 25 m to the west, returned 2.98 % Cu and 3.27 g/t Au over 2.45 m.

### DUQUET BELT

The Duquet belt is located 100 km east of Povungnituk (NTS 35B/06). It is characterized by bimodal volcanism with calc-alkaline rhyolites and andesites. **Cambiex Exploration** has signed an agreement with **Virginia Gold Mines** to acquire a 33 % interest in the Duquet property (21; figure 1A-1). Gold mineralization is associated with sericite-anthophyllite schists while the volcanogenic polymetallic mineralization (Cu-Zn-Au-Ag) is associated with sericitized felsic volcanics. The best assay results are 6.4 % Cu, 3.4 % Zn and 64 g/t Ag over 1.5 m and 6.6 g/t Au over 2.1 m.

### QALLUVIARTUUQ-PAYNE BELT

The Qalluviartuuq-Payne volcano-sedimentary belt is located 160 km ESE of Povungnituk (NTS 34O/10). Two parallel iron formation bands, stretching for more than 15 km, characterize the western part of the belt. **Cambiex Exploration** signed an agreement with **Virginia Gold Mines** and **SOQUEM INC** to acquire a 33 % interest in the Payne property. The promising Amaruk zone returned channel samples of 14.14 g/t Au over 4.9 m and 17.65 g/t Au over 3.45 m. The most significant drill intersection returned 4.74 g/t Au over 8.4 m. In the Avigaluk area a channel sample returned 2.7 g/t Au over 4.9 m.

### VENUS BELT

The Venus belt is located 100 km north of the Fontanges airport (NTS 23M/11). The Venus belt is composed of a thick, highly magnesian ultramafic volcanic sequence in its lower part. **Virginia Gold Mines** has discovered 4 showings (5; figure 1A-1). The sulphides have returned values of between 7.3 % and 9.5 % Ni and between 1.0 and 17.2 g/t Pd-Pt. At the end of the year, Virginia Gold Mines concluded an agreement with Billiton Metals Canada where Billiton can acquire a 50 % interest in the Lac Gayot property for exploration expenditures of $4.5 M.

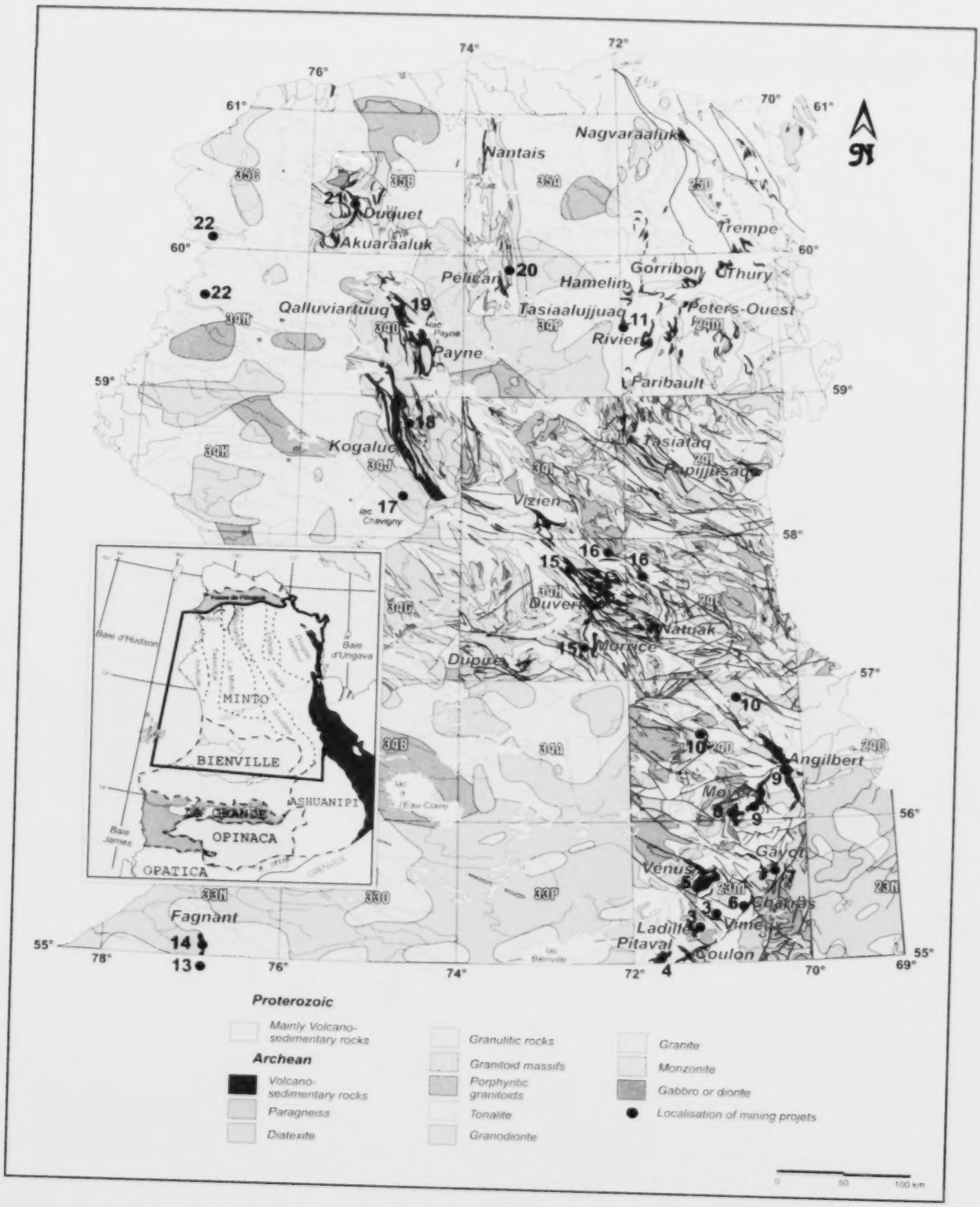
### OTHER BELTS OR REGIONS

**SOQUEM INC** and **Cambior** evaluated the uranium potential of the Lac Vernot area in NTS sheet 34H (15; figure 1A-1). Exploration work has located the bedrock vein source of lake bottom uranium anomalies. The **Nunavik Exploration Fund** began its activities in 1999 with a first project in the Povungnituk area (35C/03) focussing on Ni-Cu deposits (22; figure 1A-1). **Makamikex L.G.** explored for Ni in the Gayot belt (7; figure 1A-1). **Ashton Mining** and **SOQUEM INC** were pursuing diamond-bearing kimberlites using heavy mineral geochemical assaying of esker and till samples.

## Outlook

Géologie Québec's Far North Program had a immediate effect on the level of exploration in the area. Lake bottom geochemical survey results combined with geological mapping during the summers of 1998-99 generated several

potential exploration targets, which will most likely be explored in 2000. Major exploration work will likely be carried out for nickel the Venus, Charras and Gayot belts, for copper, zinc, silver and gold in the Duquet belt and for gold in the Fagnant belt. Diamond exploration should also continue.




Modify from Labbé 1999

**FIGURE 1A-1** – Exploration project sites in the MINTO-BIENVILLE-ASHUANIPI subprovinces in 1999.

**TABLE 1A-1 – Exploration work in the Ashuanipi, Bienville and Minto subprovinces in 1999.**

| N° | NTS | COMPANY | PROJECT | SUBSTANCE | WORK[1] |
|---|---|---|---|---|---|
| 1 | 23K/06 | Normand Noel | Gecko | Cu-Ni-Co | Pr, E |
| 2 | 23K/06 | Isabelle Saulnier | Addax | Cu, Au | Pr, G, E, Gc |
| 3 | 23M/03, 06, 07 | Mines d'Or Virginia | Ladille-Vimeux (PEM 1433) | Au, Cu, Ni | Pr, E |
| 4 | 23M/04 | Andre Lefebvre | Pitaval | Cu-Au-Ag | Pr, E |
| 5 | 23M/06, 10, 11 | Mines d'Or Virginia | Lac Gayot, (PEM 1314, 1317, 1406, 1493, 1494) | Ni-Cu-Co-EGP | GpA, Mag, EM, Pr, E, G |
| 6 | 23M/07 | Ressources Vaujour | Vaujour, (PEM 1410, 1428, 1449) | Cu-Ni-EGP | GpA(Mag-TBF-EM), EM, G, Pr, E, |
| 7 | 23M/09, 10, 15 | Makamikex L. G. | Lemming (PEM 1423) | Cu-Ni | G, Pr, E, Gc(ro) |
| 8 | 24D/01, 02, 08 | Mines d'Or Virginia, Cambior, SOQUEM INC. | Moyer, (PEM 1437,1501) | Au, Cu, Ni | Pr, E |
| 9 | 24D/02, 08, 09 | Laurent Gaudreau | Eider, (PEM 1502) | Au, Cu, Ni | Pr, E |
| 10 | 24D/11, 15 | Cambior | Lac Maricourt, (PEM 1427, 1454) | Au | Pr, E, G |
| 11 | 24M/05,12 | Mines d'Or Virginia, Cambior, SOQUEM INC. | Olympic, (PEM 1332, 1408) | Au-Cu | G, Pr, E |
| 12 | 33 nord, 34 et 23 ouest | SOQUEM INC., Ashton Mining | Ungava | Diamant | Pr, G, E, Gc(t) |
| 13 | 33K/15 | Mackenzie Watson | Lac Schindler | Au | Pr, E, G |
| 14 | 33N/02 | Mackenzie Watson, Mines d'Or Virginia | Lac Fagnant, (PEM 1223, 1305) | Au | Pr, G, E, T, Gc(t) |
| 15 | 34H/01, 02, 07, 08, 09, 15, 16 | SOQUEM INC., Cambior | Vernot, (PEM 1338, 1342, 1344, 1425, 1426) | U | Rad, Pr, E, Gc(t), G |
| 16 | 34H/16, 24E/13 | SOQUEM INC., Mines d'Or Virginia, Cambior | Qiuttuq Est et Ouest, (PEM 1419, 1420) | Au | Gc(s), Gc(t), G, Pr, E |
| 17 | 34J/07 | Mines d'Or Virginia, SOQUEM INC. | Narsaaluk, (PEM 1287) | Au | G, Pr, E |
| 18 | 34J/11, 15 | Mines d'Or Virginia, SOQUEM INC. | Kogaluk, (PEM 916, 947) | Au | Pr, E |
| 19 | 34O/10 | SOQUEM INC., Mines d'Or Virginia, Cambiex | Payne, (PEM 1139) | Au | S(17 1209), G |
| 20 | 34P/13, 14 | SOQUEM INC., Mines d'Or Virginia, Cambior | Pelican, (PEM 1340) | Au, Zn-Cu | GpA(Mag-EM), Pr, E, G |
| 21 | 35B/06 | Mines d'Or Virginia, SOQUEM INC., Cambiex | Duquet, (PEM 1213) | Au-Cu-Zn-Ag | Mag, PP, G, Pr |
| 22 | 35C/03, 34N/11 | Nunavik Mineral Exploration Fund | POVI-2 | Ni-Cu | Pr, Gc |

1. EXPLORATION WORK LEGEND

| | | | |
|---|---|---|---|
| E | Sampling | Mag | Magnetic survey |
| EM | Electromagnetic survey | IP | Induced polarization survey |
| G | Geological survey | Pr | Prospecting |
| Gc | Undefined geochemical survey | Rad | Radiometric survey |
| Gc(ro) | Rock geochemical survey | S(m) | Diamond drilling (number, total metres) |
| Gc(t) | Till geochemical survey | TBF | VLF electromagnetic survey |
| GpA | Airborne geophysical survey | ☐ | MRN subsidized project |

# 1B
# The James Bay region: The central part of the Superior Province (Opatica, Opinaca, Nemiscau and La Grande subprovinces)

Rémy Morin

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Exploration investment in the James Bay territory reached $7.84 M in 1999, including $1.56 M from the Québec Government through its Mining Exploration Assistance Program in the Mid-North. Furthermore, $1.03 M was allotted to geoscientific studies and surveys by the Québec Government. A total of 26,900 m were drilled and 51 exploration projects were conducted in 1999.

Exploration efforts were mainly focussed in the Frotet-Evans, the Eastmain and the La Grande greenstone belts.

## Frotet-Evans region

Twenty-seven projects were active in the Frotet-Evans region, for a total of $5.30 M, which represents 68 % of the amount for off-mining-site exploration expenditures in the James Bay territory.

In the western part of the Frotet-Evans belt (Evans sector), **Nuinsco Resources** (18; figure 1B-1) in the Lac Rocher sector announced in January 1999 that hole 99-1 intersected a 3.2 m wide mineralized zone returning 10.8 % Ni, 0.25 % Cu and 0.23 % Co. This announcement triggered a staking rush and more than 11,000 claims were staked during the spring of 1999 by more than 60 companies. Following this discovery, **Nuinsco Resources** proceeded with an aggressive drilling campaign totalling 12,319 m in 61 holes. This campaign failed to extend significantly the original mineralized zone. However, several companies are interested in the numerous geophysical anomalies and in the favorable context and this situation could lead to the continuation of exploration work in the area.

In the northern part of the Frotet sector, the beginning of production at the Troilus deposit in early 1997 by **INMET Mining Corporation**, with reserves of 49,590,000 t at 1.38 g/t Au, 0.12 % Cu and 1.23 g/t Ag, demonstrates the gold potential of the sector. The southern part is itself well known for massive sulphide occurrences and showings with most of these discovered in the last few years.

## Eastmain region

The Eastmain region has seen 10 projects for a total of $0.92 M, which represents 12 % of the off-mining-site exploration expenditures in the James Bay territory. The exploration projects are located in the Lower Eastmain River greenstone belt.

On the Clearwater property (28; figure 1B-1), **SOQUEM INC** and **Eastmain Resources** have been exploring around the Eau-Claire deposit. During the last two years (1997-1998), exploration work has increased the geological resources to 540,000 t at 11.13 g/t Au for the G, I and J veins. The discovery by stripping of veins O, P and Q should contribute to the substantial increase of the geological resources of the deposit. The P Vein, 130m long, has an average grade of 12.34 g/t Au over a minimum width of 2 m. The O and Q veins, 150 m in length, located 15 m north of the P vein, returned respectively 64.32 g/t Au over 2 m and 24.31 g/t Au over 1.7 m with an average grade of 10.7 g/t Au. **SOQUEM INC** and **Eastmain Resources** have been granted financial assistance of $100,000 for each of the last three years by virtue of the Mining Exploration Assistance Program for the Mid-North.

## La Grande region

The La Grande region has generated 14 projects for a total of $1.62 M, which represent 20 % of off-mining-site exploration expenditures in the James Bay territory. The exploration projects are found in two sectors: western and eastern La Grande.

In the western sector, **Virginia Gold Mines** has continued its work on the La Grande South property (43; figure 1B-1) where the Zone 32 was discovered in 1997. The Zone is found in a sheared tonalitic stock in contact with basalts. **Virginia Gold Mines** estimates the geological inventory of this zone at 420,000 t at 2.1 g/t Au (1.0 g/t Au cut-off grade, March 1999 press release). A channel sample from a trench returned 19.64 g/t Au over 3 m. In June 1999, **Cambior** joined **Virginia Gold Mines** to carry out a till survey, which returned numerous samples anomalous in gold. To the west, at the western end of Lac Ménarik, **Dianor Resources** (42; figure 1B-1) announced the discovery of new showings on their 1404 project. This confirms the continuity of a 1.7 km long and 100 m wide gold-bearing corridor. The best assay value is 6.3 g/t Au and 14.6 g/t Ag over 3.4 m.

In the eastern sector, on the Aquilon property (50; figure 1B-1), **Sirios Resources** and **SOQUEM INC** reported the discovery of several new gold-bearing showings in a new gold-bearing quartz vein system several meters thick. Grab samples returned values between 3 and 211 g/t Au. On the Tilly property (48; figure 1B-1), a geochemical till survey and mechanical stripping programs by **Sirios Resources** and **SOQUEM INC** showed the presence of an important gold dispersion train in the tills.

## Outlook

Recent discoveries should maintain interest in the James Bay territory. Most of the companies should continue their work in the year 2000 with similar exploration budgets if financing conditions are favorable.

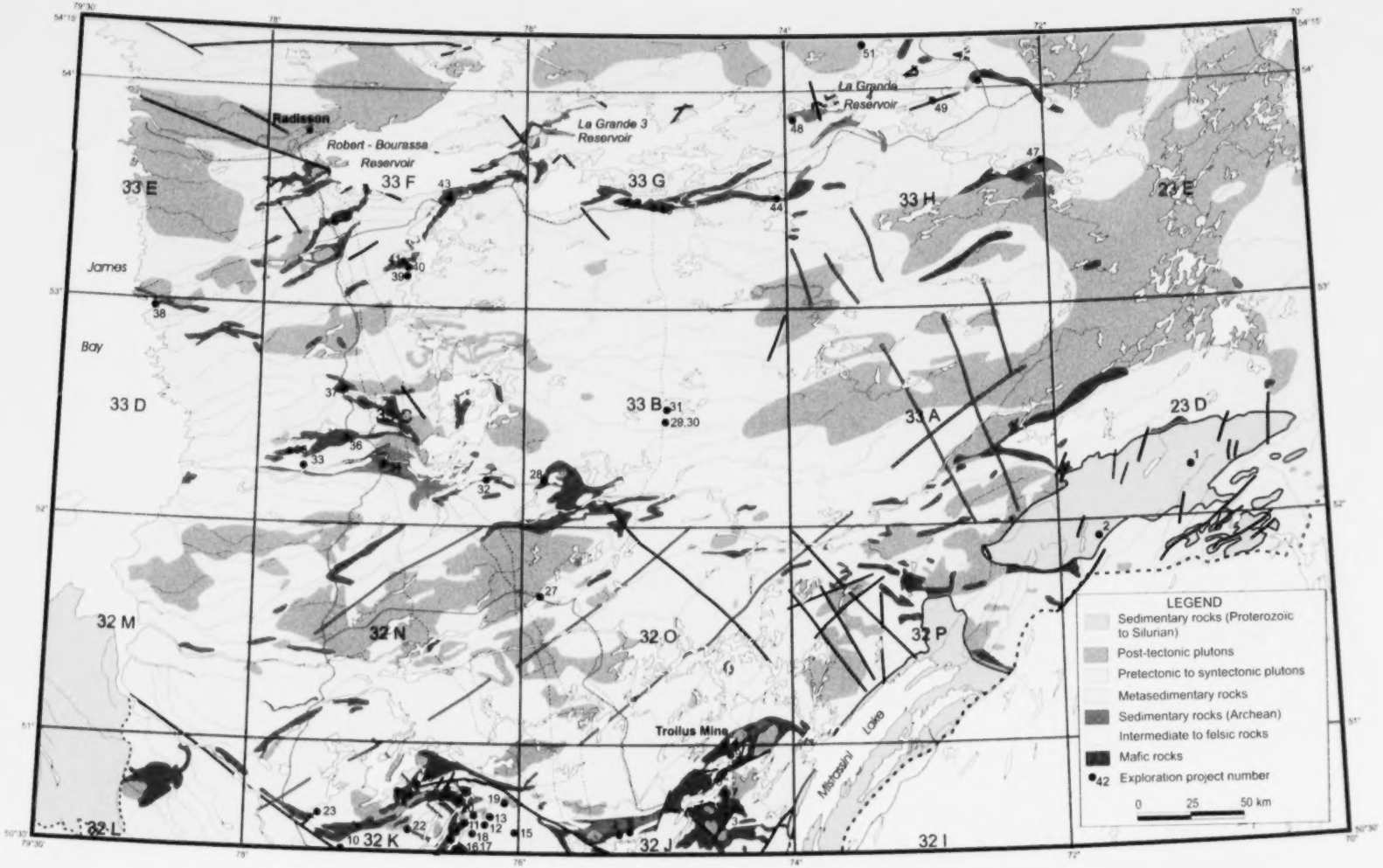


**FIGURE 1B-1** – Exploration project sites in James Bay area for 1999.

**TABLE 1B-1 – Exploration projects on the James Bay area in 1999 (see figure 1B-1).**

| N° | NTS | COMPANY | PROJECT | SUBSTANCE | WORK[1] |
|---|---|---|---|---|---|
| 1 | 23D/02 et 23D/03 | Exploration Boréale et Sanmei Gao | Périboncor-1 | Au | Pr |
| 2 | 23D/04 et 22M/13 | Rémy Laprise | Indicator | Au | Pr |
| 3 | 32J/09 | Pietro Costa | Tanaka | Au-Cu-Ni | Pr |
| 4 | 32J/11 | Cominco | Garevan | Cu-Zn | Gp, S (2:501) |
| 5 | 32J/11 | SOQUEM INC. et Pangea Goldfield | Assinica | Cu-Zn | G, T |
| 6 | 32J/15 | SOQUEM INC. | Troilus Free Gold | Au-Cu | G, T |
| 7 | 32J/15 | SOQUEM INC. | Roméo Boisvert | Zn-Cu-Au-Ag | T, E |
| 8 | 32J/15 et 32O/01 | Corporation minière Inmet | Troilus | Au | Gp, S (8:3300) |
| 9 | 32J/15, 32J/16 et 32O/01 | Corporation minière Inmet et SOQUEM INC. | | Troilus | Au GpA |
| 10 | 32K/05, 32K/06, 32K/11 et 32K/12 | Christian Desrosiers | KM 145 | Cu-Zn-Pb-Ni | Pr |
| 11 | 32K/09 | Falconbridge, Noranda et Donner Minerals | Lac Rocher PN 146 | Ni-Cu-Co-EGP | GpA |
| 12 | 32K/09, 32K/10, 32K/11 et 32J/12 | Falconbridge et Donner Minerals | Lac Rocher PN 145 | Ni-Cu-Co-EGP | GpA, G, Pr, T |
| 13 | 32K/09 | Goldwater Resources | Lac Salamandre | Ni-Cu-Zn-Au | Gp |
| 14 | 32K/09 | International Kirkland Minerals et Dumont Nickel Corp. | Foreurs prospect | Ni-Cu | G, Gp, S (5:745 ) |
| 15 | 32K/09 | International Kirkland Minerals | Huskies | Ni-Cu | Gp, S (6:2195 ) |
| 16 | 32K/09 | Michel Lavoie | Lac Rocher | Ni-Cu-Co | Pr, T |
| 17 | 32K/09 | Richard Lavoie | Lac Rocher | Ni-Cu-Co | Pr, T,Gp |
| 18 | 32K/09 | Nuinsco Resources | Lac Rocher | Ni-Cu-Pt | Gp, G, T, S (61:12319) |
| 19 | 32K/09 | Queenston Mining | Wildcats | Cu-Ni | Gp, S (1:192) |
| 20 | 32K/09 | Ressources Freewest | Lac Rocher | Ni-Cu-Pt | GpA |
| 21 | 32K/09 et 32K/16 | SOQUEM INC. et Mines Altavista | Quenonisca | Zn-Cu-Au-Ag | Gp |
| 22 | 32K/10 | Goldeye Explorations | Lac Rocher | Ni-Cu | Gp |
| 23 | 32K/12 | Gestion Lupak | Eider | Cu-Mo-Au | G, T |
| 24 | 32K/15 et 32K/09 | Caribgold | Lac Evans | Cu-Ni | GpA, G, S (12 :1441) |
| 25 | 32K/15 | Falconbridge, Exploration Maude Lake et Ressources Sirios | Lac Rocher | Ni-Cu | Gp, G |
| 26 | 32K/15 | Cominco | Corbevan | Cu-Zn | Gp, S (3:762) |
| 27 | 32O/12 | Sebastien Tolgeysi | Kaptukamach | Au-Cu-Ni | Pr |
| 28 | 33B/04 | SOQUEM INC. et Eastmain Resources | Clearwater | Au | G, Gc, T, S (9:2150) |
| 29 | 33B/07 | Luc Lamarche | 33B/07 | Au | Pr, T |
| 30 | 33B/10 | Jean-Raymond Lavallée | 33B/10 | Au | Pr, T |
| 31 | 33B/10 | Jean-Raymond Lavallée | 33B/10-Or | Au-Cu-Ni | Pr |
| 32 | 33C/01 | Mines d'Or Virginia | Opinaca | Au,Zn | Pr, G |
| 33 | 33C/03, 33C/04, 33C/05 et 33C/06 | Donald Namagoose | Eastmain Band # 1 | Au-Cu | Pr |
| 34 | 33C/03, 33C/04, 33C/05 et 33C/06 | Christopher Harodier | Eastmain Band # 2 | Au-Cu | Pr |
| 35 | 33C/05 | Cambior et Eastmain Resources | Lac Elmer | Au | Pr, G, S (5:1780) |
| 36 | 33C/06 | Ressources Aurbec | Opinaca | Au-Cu-Zn | E |
| 37 | 33C/11 | Patrice Villeneuve | 33C/11 | Au | Pr |
| 38 | 33D/15 | Cree Nation of Wemindji | Wemindji | Au-Ag-Zn | Pr |
| 39 | 33F/02 | Jean-Raymond Lavallée | Indice d'or Sakami | Au | Pr, T, Gp |
| 40 | 33F/02 | Luc Lamarche | Péninsule Sakami | Au | Pr, |
| 41 | 33F/02 et 33F/03 | Mines d'Or Virginia | Apple | Au | G, Pr, Gc(t) |
| 42 | 33F/05 et 33F/06 | Ressources Dianor | 1404 | Au-Cu-Ag | Pr, G, T |
| 43 | 33F/10 | Cambior et Mines d'Or Virginia | La Grande Sud | Au | Gc(t), G, T, |
| 44 | 33G/08 et 33G/09 | Mines d'Or Virginia et Silver Century Expl. | Lac Corvet Ouest | Au | Gp, G, T |
| 45 | 33G/06 | Exploration Boréale et Mines d'Or Virginia | Poste Lemoyne | Au | G, Gp, T,Gc(t) |
| 46 | 33G/11 | Mines d'Or Virginia et Silver Century Expl. | Lac Guyer | Au-Ag-Cu-Zn | G, T |
| 47 | 33H | Cambior | Caniapiscau | Au | |

**TABLE 1B-1 – (cont'd)**

| N° | NTS | COMPANY | PROJECT | SUBSTANCE | WORK[1] |
|---|---|---|---|---|---|
| 48 | 33H/13 | Ressources Sirios et SOQUEM INC. | Tilly | Au | G, T, Gc(t) |
| 49 | 33H/15 | Marie-Josee Girard | 33H/15 | Au | Pr, Gp, G |
| 50 | 33I/01 et 3I/02 | Ressources Sirios et SOQUEM INC. | Aquilon | Au-Ag-Cu-Zn | Gc(t), G, T, S (10:1515) |
| 51 | 33I/06 et 3I/05 | Harold Desbiens | 33I/06 et 33I/05 | Au | Pr, Gp, G |

LEGEND: **Pr**: prospecting; **G**: geological survey; **Gp**: ground or down-hole geophysical survey; **GpA**: airborne geophysical survey; **Gc**: geochemical survey; **Gc(t)**: till geochemistry; **E**: sampling; **Ev**: bulk sampling; **ET**: technical study and compilation; **EF**: feasibility study; **S**: drilling (number of holes: meters drilled); **Sci**: reverse circulation drilling; **T**: trench and stripped area; **TM**: metallurgical testing.

☐ MRN subsidized project

# 1C
# The southern part of the Superior Province

Chantal Dussault
Pierre Doucet

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## Abitibi and Pontiac subprovinces

The Abitibi subprovince underlies the southeast part of the Superior Province in Québec and is the biggest Archean volcano-sedimentary belt in the world.

The Abitibi subprovince is recognized worldwide for its numerous and high-grade precious metal (Au-Ag) and polymetallic (Cu-Zn-Au-Ag and Cu-Au) deposits. Mining and exploration of these deposits has made this vast territory one of the main mining regions in Québec for more than 80 years. In 1999, thirteen gold deposits (Joe-Mann, Géant-Dormant, Francoeur, Mouska, Doyon, Donald-J.-LaRonde, Bousquet 2, Kiena, Joubi, Beaufor, Sigma-Lamaque, Sigma 2 and East Amphi) and seven polymetallic deposits (Selbaie, Gonzague-Langlois, Bouchard-Hébert, Gallen, Bell-Allard and Louvicourt, and the zinc-bearing zone at LaRonde mine) were in production.

In 1999, the Abitibi area was the most explored area in Québec. A total of 183 exploration projects were active in 1999 and the total investment reached $32.5 M. One hundred and ten of these projects were focussed on gold, for an investment of $19.1 M. Seventy-three projects targeted polymetallic deposits for expenditures of $13.4 M, a significant increase from 1998 (66 projects for $12.1 M). It should be noted that 26 grass roots prospecting projects and 32 advanced prospecting projects have received $0.55 M in financial assistance from the Exploration Assistance Program of Québec. Finally, the deep drilling assistance program continued in 1999. Forty drill holes were subsidized for a total of $0.98 M.

**Aurizon Mines**' Casa Bérardi (26) project has advanced significantly during the year. The company completed an exploration campaign of more than $3.8 M including 76,000 m of drilling. Numerous impressive intersections were returned from Zone 113, such as 40.7 g/t Au over 13.6 m, 32.2 g/t Au over 15.5 m and 19.3 g/t Au over 14.8 m. Measured and indicated resources are 6.925 Mt at a grade of 7.41 g/t Au and inferred resources are 2.252 Mt at a grade of 9.2 g/t Au. The company is completing an internal feasibility study.

**Maude Lake Exploration** has been getting excellent results from a 3,741 m drill program on its Comtois (34) project. The drill holes have outlined two gold-bearing structures, Zones A and B, between the surface and 400 m in depth. On Zone A, hole 99-54 returned an 11.5 m section grading 9.8 g/t Au within a 20.1 m interval grading 6.1 g/t Au. On Zone B, sections of 3 m at 5.8 g/t Au and 5.1 m at 2 g/t Au have been reported.

**SOQUEM INC** has obtained good results on its Brosman (78) property near Chibougamau. A gold-bearing structure, 300 m in length at surface and continuing down to a depth of 430 m, has been identified. Drill results include 5.87 g/t Au over 5.5 m, 5.05 g/t Au over 6.1 m and 1.86 g/t Au over 45 m. Channel sampling returned values of 14.22 g/t Au over 7 m, 65.78 g/t Au and 49 g/t Ag over 1 m and 63.8 g/t Au and 18.2 g/t Ag over 1 m. **Major General Resources** and **Cameco Gold** have begun a drilling program on their Despinassy (45) project. Intersections from hole 99-17 include 26.0 g/t Au over 3.1 m, 7.3 g/t Au over 5.1 m and 10.4 g/t Au over 1.6 m.

**Agnico-Eagle Mines** continued exploration at the LaRonde (19) mine in Bousquet Township. Zone 20N, Zone 20S and Zone 7 are being developed. In October 1999, the company announced that hole 3170-11B intersected Zone 20N at a depth of 2,990 m, with 15.9 m at 5.9 g/t Au, 5.6 g/t Ag, 0.18 % Cu and 0.01 % Zn. The Wesdome (104) deposit is currently under development by **Western Quebec Mines** and **Dynacor**. Emphasis was placed on four zones (A, B, E and E3). Compilation, interpretation and evaluation of Zone A have established the indicated and inferred resources at 597,000 tonnes at a grade of 5.16 g/t Au.

The Casa Bérardi-Joutel-Matagami sector of the Abitibi subprovince is the most active for base metal exploration. **Noranda/South Africa Minerals** have completed 3,200 m of drilling on the Caber (P49) project. A feasibility study was prepared in May 1999. Resources are evaluated at 800,000 t at a grade of 10 % Zn, 0.6 % Cu and 11 g/t Ag. Two km north of the Caber project is the Caber North deposit. Resources of 2.1 Mt at 4.1 % Zn, 1. 5 % Cu and 19 g/t Ag have already been delineated. **INCO/Cancor Mines** have been getting impressive results from their 1999 drill campaign (9,000 m) on the Gemini (P13) project. Hole 70 returned a 12.81m section grading 9.67 % Zn, 0.20 % Cu, 57.4 g/t Ag and 3.37 g/t Au. **Cambior** and **Mackenzie Bay** invested close to $0.5 M in their Lac Doré (P55) vanadium project. This vanadium deposit is the biggest in North America and the second largest in the world. Resources are evaluated at 350,000,000 t at 0.45 % $V_2O_5$.

## Outlook

A vast portion of the Abitibi belt remains unexplored. We believe that the Abitibi area still bosts a high mineral potential. Promising discoveries such as Caber southwest of Matagami, Despinassy in the Lebel-sur-Quévillon area, Brosman near Chibougamau and Gemini in Casa Bérardi Township attest to this potential.

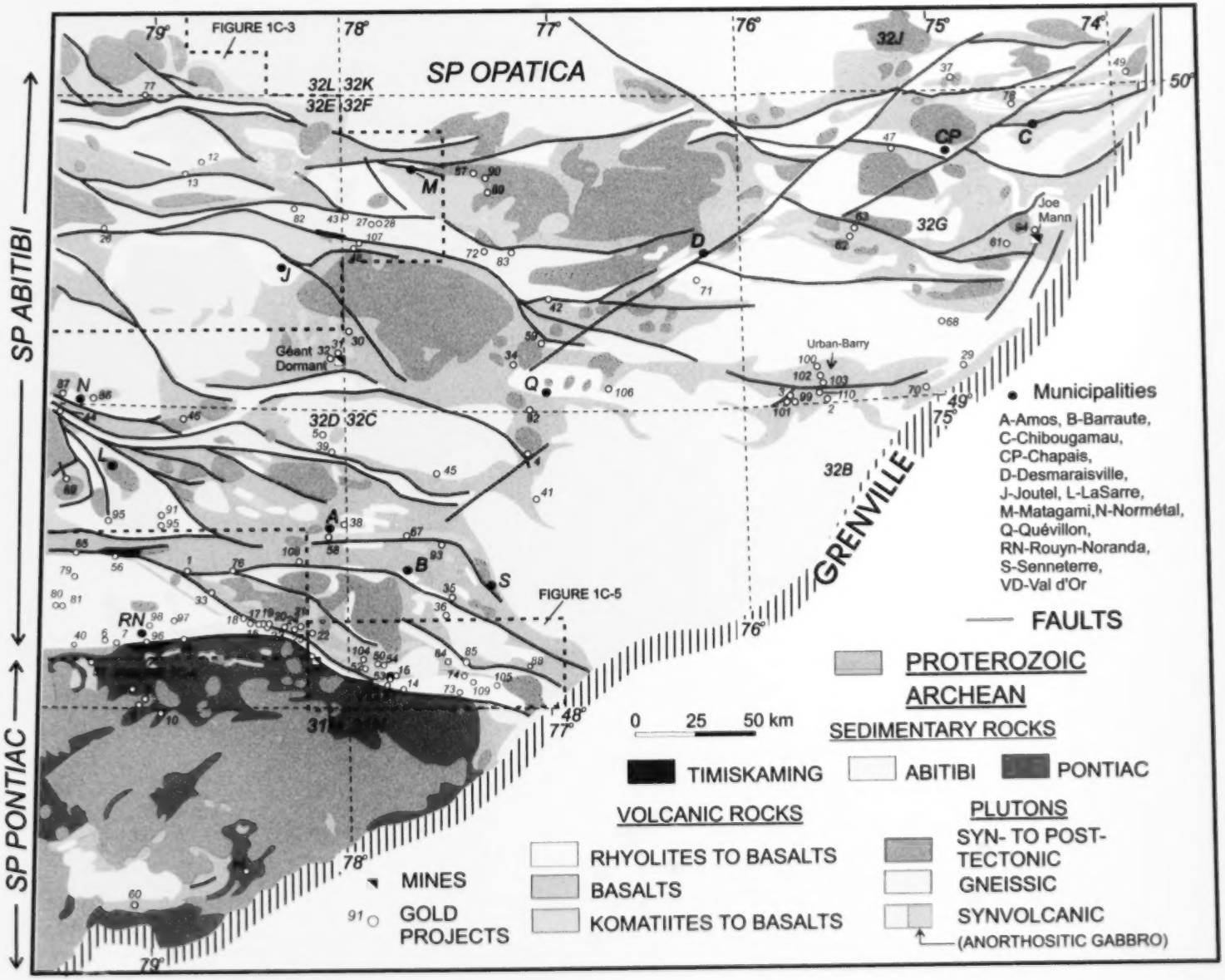


**FIGURE 1C-1** – Location of exploration projects and gold operations in the Abitibi and Pontiac subprovinces. (Modified geology from Hocq & Verpaelst, 1994).

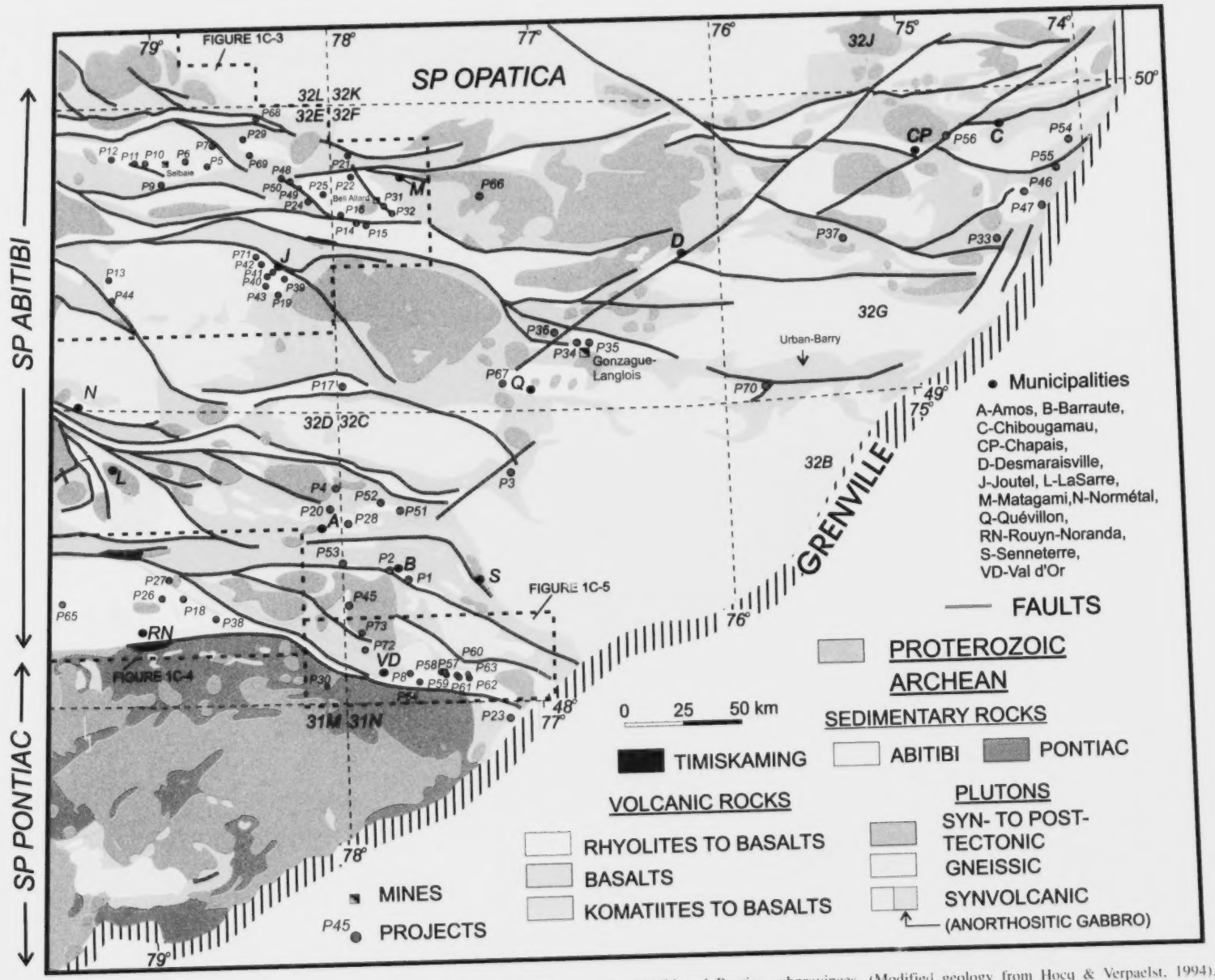


**FIGURE 1C-2** – Location of exploration projects and polymetallic operations in the Abitibi and Pontiac subprovinces. (Modified geology from Hocq & Verpaelst, 1994).

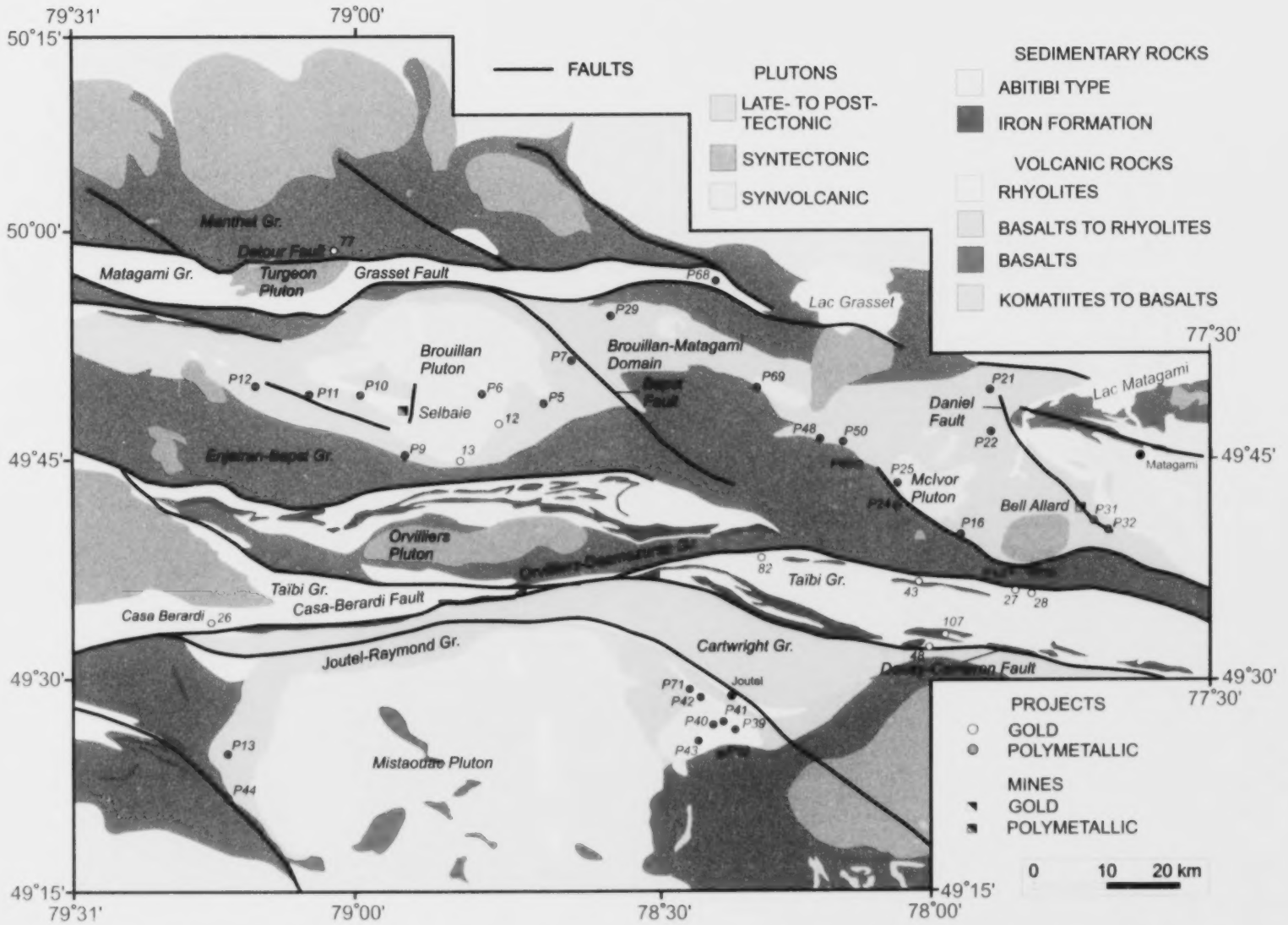


FIGURE IC-3 — Location of exploration projects and mines in the Fénelon-Matagami-Casa Berardi-Joutel area. (Modified geology from Lacroix *et al.*, 1990).

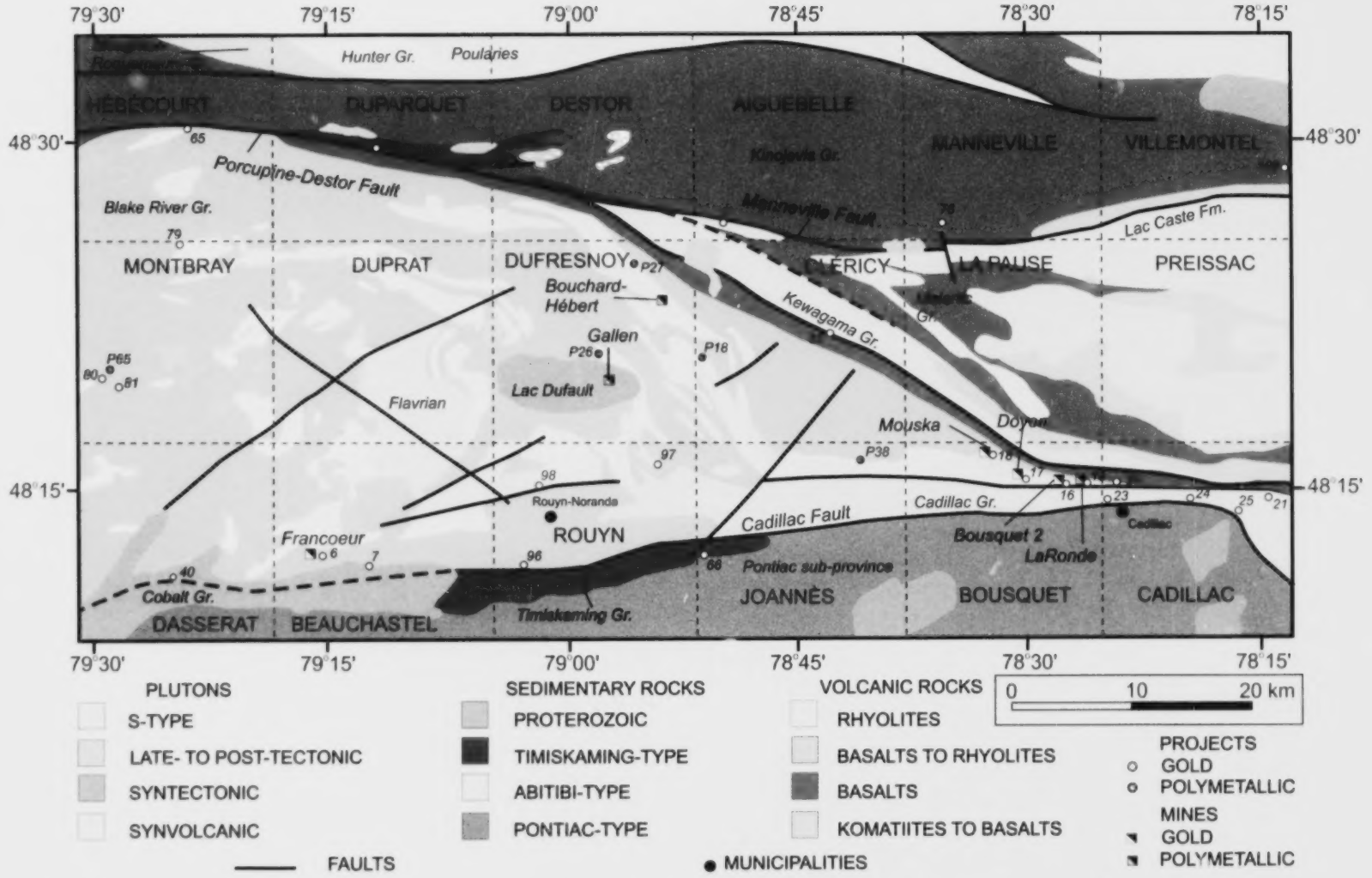


**FIGURE IC-4** – Location of exploration projects and mines in the Rouyn-Noranda-Cadillac area. Modified geology from Avramtchev and Lebel-Drolet (1981) & Couture (1991).

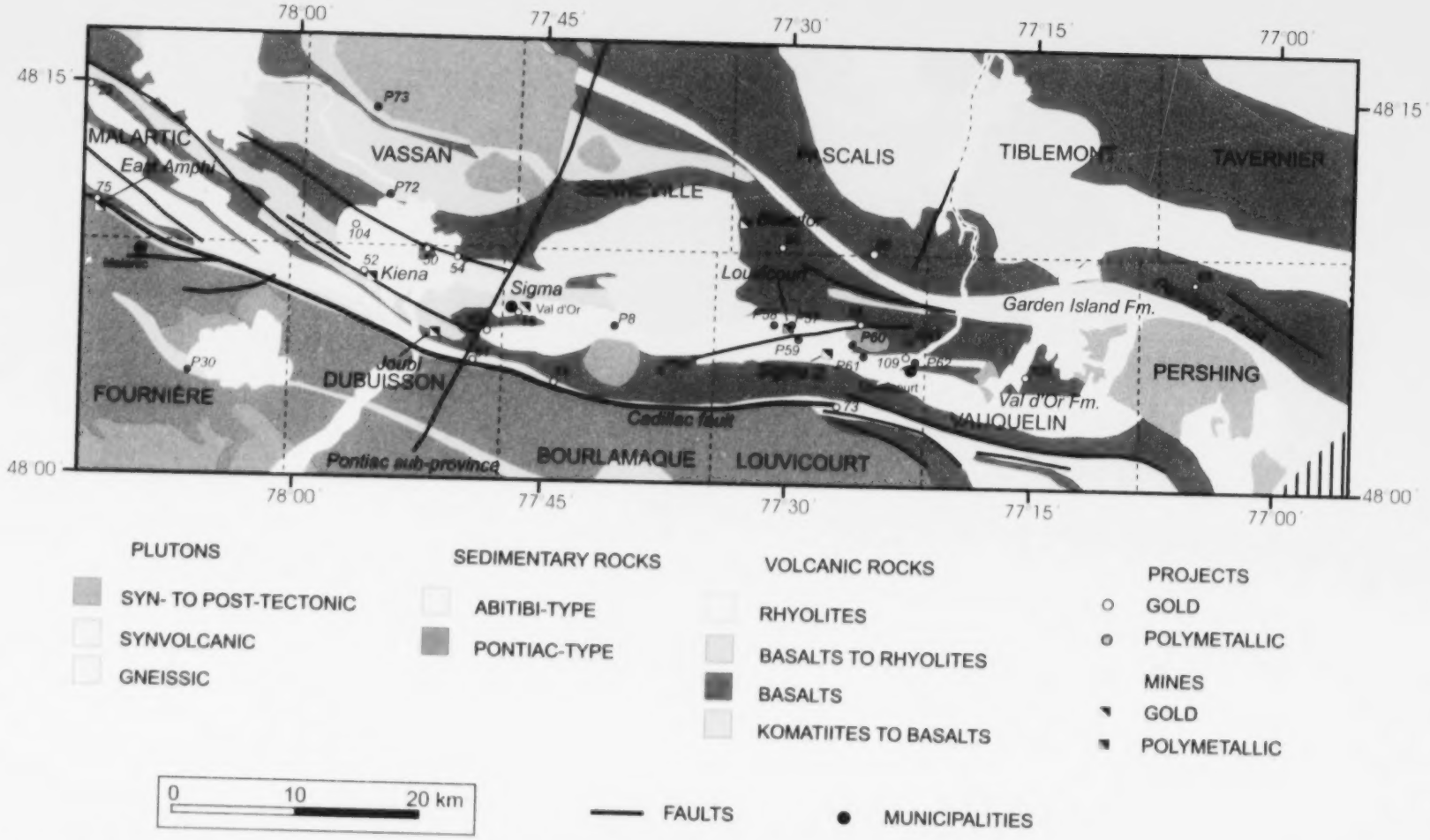


**FIGURE IC-5** – Location of exploration projects and mines in the Malartic-Val d'Or area. (Modified geology from Avramtchev and Lebel-Drolet 1981 & Couture 1991).

**TABLE 1C-1 – Gold exploration work in the Abitibi and the Pontiac subprovinces in 1999.**

| N° | TOWNSHIP | FIG. | NTS | COMPANY | PROJECTS | SUBSTANCE | WORK[1] |
|---|---|---|---|---|---|---|---|
| 1 | Aiguebelle | 1C-4 | 32D/07 | Cristobal | Pare | Au | S(5:999) |
| 2 | Barry/Bailly | 1C-1 | 32B/13 | Mines d'or Virginia | Barry-Bailly | Au | Mag,PP |
| 3 | Barry/Souart | 1C-1 | 32B/13 | Ress. Gold Hawk | Barry-Souart | Au | G,Gp,Pr |
| 4 | Bartouille | 1C-1 | 32C/14 | D. Fortin | Bartouille nord | Au,Cu,Zn | Pr |
| 5 | Bearn | 1C-1 | 32D/16 | D. Cyr | Bearn | Au,Cu,Zn,Ag | Pr |
| 6 | Beauchastel | 1C-4 | 32D/03 | Mines Richmont | Francoeur | Au | S(141:16410) |
| 7 | Beauchastel | 1C-4 | 32D/03 | Mines Richmont | Wasamac | Au | S(1:672) |
| 8 | Bellecombe | 1C-1 | 32D/02 | P. Adomaitis | Oz | Au,Cu,Zn | Pr |
| 9 | Bellecombe | 1C-1 | 32D/02 | R. Grenier | Strawman | Au,Cu,Zn | Pr |
| 10 | Bellecombe | 1C-1 | 32D/02 | P. Bambic | Tinman | Au,Cu,Zn | Pr |
| 11 | Bellecombe | 1C-1 | 32D/02 | G. Henriksen | Wizard | Au,Cu,Zn | Pr |
| 12 | Beschefer | 1C-3 | 32E/15 | SOQUEM INC./ Billiton Metaux Canada | Beschor (B-14) | Au | ET |
| 13 | Beschefer | 1C-3 | 32E/15 | Ressources Yorbeau | Casa-Berardi Ouest | Au,Cu,Zn,Ag | S(10:1891),PP,PEM |
| 14 | Bourlamaque | 1C-5 | 32C/04 | Ressources Aur | Airport | Au | S(1:407) |
| **15** | **Bourlamaque** | **1C-5** | 32C/04 | **Mines McWatters** | **Sigma** | **Au** | **S(500:35000)** |
| 16 | Bousquet | 1C-4 | 32D/01 | Barrick Gold Corp | Bousquet 2 | Au | S(40:4500) |
| 17 | Bousquet | 1C-4 | 32D/01 | Cambior | Doyon | Au | S(16:3767),G(ro),T,G |
| 18 | Bousquet | 1C-4 | 32D/01 | Cambior/Inmet | Mouska-Authier | Au | S(11:2609),G |
| **19** | **Bousquet** | **1C-4** | 32D/01 | **Mines Agnico-Eagle** | **Mine LaRonde Zone 20N** | **Au,Cu,Zn,Ag** | **S** |
| 20 | Cadillac | 1C-4 | 32D/01 | Mines Agnico-Eagle | El Coco Est | Au,Ag,Cu,Zn | S(?:720), Gp |
| 21 | Cadillac | 1C-4 | 32D/01 | Mines Agnico-Eagle | Sphinx | Au,Ag,Cu,Zn | S(?:2102), Gp |
| 22 | Cadillac/Malartic | 1C-5 | 32D/01 | Norcal Resources | Heva-Malartic | Au | Gc(s) |
| 23 | Cadillac | 1C-4 | 32D/01 | Ressources minieres Radisson | O'Brien | Au | ET |
| 24 | Cadillac | 1C-4 | 32D/01 | Queenston Mining | Pandora Gold | Au | S(5:3050) |
| 25 | Cadillac | 1C-4 | 32D/01 | Cambior | Lapa | Au | S(4:2850) |
| 26 | Casa Berardi | 1C-3 | 32E/11 | Mines Aurizon | Casa Berardi | Au | S(192:50 811) |
| 27 | Cavelier | 1C-3 | 32F/12 | GéoNova-Gowest Amalgamated | Cavelier-Gowest | Au | S(6:1641) |
| 28 | Cavelier/Galinee | 1C-3 | 32F/12 | SOQUEM INC./ Ressources Diabex | Cavga (1133) | Au,Cu,Zn | PP |
| 29 | Chamballon | 1C-1 | 32G/02 | J. Viger | Beaumier | Au,Cu,Zn | Pr |
| 30 | Chaste | 1C-1 | 32F/04 | D. Cyr/P. Lariviere | Riviere Coigny | Au,Cu,Zn,Ag | Mag,G |
| 31 | Chaste/Maizeret | 1C-1 | 32F/04 | Cambior/Mines Aurizon | Géant-Dormant | Au | S(9:3744),PP,Mag, Gc(ro) |
| 32 | Chaste/Maizeret | 1C-1 | 32F/04 | Cambiex/Aurizon | Dormex | Au | S(2:630),PP,Mag |
| 33 | Clericy | 1C-4 | 32D/07 | P. Carbonneau | Parfouru | Au,Cu,Zn | Pr |
| 34 | Comtois | 1C-1 | 32F/03 | Exploration Maude Lake/ Cameco | Comtois | Au,Cu,Zn | S(21:5350) |
| 35 | Courville | 1C-1 | 32C/06 | Ress. Garmin/ Ress. Autanabi | Courville-St-Yves Blocs 2-3 | Au | Mag,TBF |
| 36 | Courville | 1C-1 | 32C/06 | Ress. Garmin/ Ress. Autanabi | Courville-St-Yves Bloc 1 | Au | Mag,TBF |
| 37 | Cuvier | 1C-1 | 32G/15 | Ouje Bougoumou | Opemisca | Au,Cu,Zn | Pr |
| 38 | Dalquier | 1C-1 | 32D/09 | D. Cyr | Harricana Est | Au,Cu | Pr |
| 39 | Dalquier | 1C-1 | 32D/09 | D. Cyr | Dalquier II | Au | Pr |
| 40 | Dasserat/Dufay | 1C-4 | 32D/03 | Silver Century | Dasserat 371, 374 | Au | S(4:1969),PP,Mag, Gc(t) |
| 41 | Delestre | 1C-1 | 32C/10 | Sirios | Delestre | Au | G |
| 42 | Desjardins | 1C-1 | 32F/06 | SOQUEM INC./Cancor | Etang John | Au | Mag,TBF,G |
| 43 | Desmazures | 1C-3 | 32E/09 | Mines Agnico-Eagle | Desmazures | Au,Zn | S(5:1140),PP,Mag |
| 44 | Desmeloizes | 1C-1 | 32D/14 | P. Gosselin | Gosselin 2000-2 | Au,Cu,Zn | Pr |

**TABLE 1C-1 – (cont'd)**

| N° | TOWNSHIP | FIG. | NTS | COMPANY | PROJECTS | SUBSTANCE | WORK[1] |
|---|---|---|---|---|---|---|---|
| 45 | Despinassy | 1C-1 | 32C/14 | Major General Res./ Cameco Gold | Despinassy | Au | S(18:4427),PP,Mag |
| 46 | Disson | 1C-1 | 32D/15 | G. Lamothe | Disson | Au,Cu,Zn | Pr |
| 47 | Dolomieu | 1C-1 | 32G/14 | M. Bouchard | Dolodau | Au,W | T,G,Gc(ro) |
| 48 | Douay | 1C-3 | 32E/09 | Mines Aurizon/Vior | Douay | Au | S(3:2486) |
| 49 | Duberger | 1C-1 | 32I/04 | R. Audet | Duberger | Au,Cu,Zn | Pr |
| 50 | Dubuisson | 1C-5 | 32C/04 | Mines Dynacor | Siscoe | Au | S(?:3000) |
| 51 | Dubuisson | 1C-5 | 32C/04 | SOQUEM INC./ Ressources Diabex | Sylvie | Au | Mag |
| 52 | Dubuisson | 1C-5 | 32C/04 | Mines McWatters | Kiena | Au | S(9:3500),Gc(ro) |
| 53 | Dubuisson | 1C-5 | 32C/04 | P.-A. Bigué | Bigué | Au | S |
| 54 | Dubuisson | 1C-5 | 32C/04 | Northern Abitibi Mining/ Beaufield Res. | Siscoe | Au | S(3:?),GpA |
| 55 | Dufay/ Montbeillard | 1C-4 | 32D/03 | Silver Century | Lac Evain 372 | Au,Cu,Zn | Gc(t),Sct |
| 56 | Duparquet | 1C-4 | 32D/06 | SOQUEMINC./GéoNova | Pitt Gold | Au | ET |
| 57 | Dussieux/Morris | 1C-1 | 32F/15 | SOQUEM INC. | Olga (1029) | Au | S(3:762) |
| 58 | Figuery | 1C-1 | 32D/08 | R. Hamel | Figuery | Au,Cu,Zn | S |
| 59 | Franquet | 1C-1 | 32F/02 | B. Osborne | Franquet | Au,Cu | Gp |
| 60 | Gaboury | 1C-1 | 31M/06 | L. Hallé | Brisebois | Au,Pt,Pd | Pr |
| 61 | Gamache | 1C-1 | 32G/07 | Mines Altavista/SOQUEM | Philibert | Au,Cu,Zn | S(10:2382) |
| 62 | Guercheville | 1C-1 | 32G/11 | Exploration Boréale/SDBJ | Fenton | Au | S(7:1600),PP |
| 63 | Guercheville | 1C-1 | 32G/11 | Exploration Boréale/Arca | Fenton Centre | Au | E |
| 64 | Guillet | 1C-1 | 31M/07 | Ressources Autanabi | Guillet | Au | S(?:689) |
| 65 | Hébécourt | 1C-4 | 32D/06 | Cambior/Cogema | Porcupine | Au | S(10:2800),PP,G,Gc(ro) |
| 66 | Joannès | 1C-4 | 32D/02 | C. Chouinard | Joannès | Au,Ag,Cu,Pb | S(1:195) |
| 67 | La Morandière | 1C-1 | 32C/12 | R. Gauthier | Extension Daljo | Au | Pr |
| 68 | Langloiserie | 1C-1 | 32G/06 | P. Costa | Roméo | Au | Pr |
| 69 | La Reine | 1C-1 | 32D/14 | Mines Altavista | Santa Anna | Au | EF,ET |
| 70 | L'Espinay/Buteux | 1C-1 | 32G/03 | S. Bosum | Freeman Est | Au,Cu,Zn | Pr |
| 71 | Le Tac | 1C-1 | 32F/08 | SOQUEM INC./ Expl. minière du Nord | Le Tac (4041) | Au,Ag,Zn | S |
| 72 | Le Tardif | 1C-1 | 32F/11 | D. St-Pierre | Le Tardif | Au,Ag | Gp |
| 73 | Louvicourt | 1C-5 | 32C/03 | SOQUEM INC./Provenor | Rivière Marias | Au | PP |
| 74 | Louvicourt | 1C-5 | 32C/03 | Mines Aurizon | Beacon | Au | S(18:1775),G |
| **75** | Malartic | 1C-5 | 32D/01 | Mines McWatters | East-Amphi | Au | S(?:2500) |
| 76 | Manneville | 1C-4 | 32D/07 | 297-3090 Canada | Hooking-Manneville | Au | Mag,TBF,T |
| 77 | Martinière/ La Peltrie | 1C-3 | 32L/03 | International Taurus/ Cyprus Canada | Martinière D | Au | S(9:1869) |
| 78 | McKenzie | 1C-1 | 32G/16 | SOQUEM INC. | Brosman (1230) | Au,Cu | S(20:4015),T |
| 79 | Montbray | 1C-4 | 32D/06 | Mines Altavista | Kanasuta | Au,Cu,Zn | ET |
| 80 | Montbray | 1C-4 | 32D/06 | Mines Agnico-Eagle | Montbray | Au | S(?:593) |
| 81 | Montbray | 1C-4 | 32D/06 | Y. Lalth | Montbray | Au,Cu,Ag | T,G,Gc(ro) |
| 82 | Montgolfier/ Aloigny | 1C-3 | 32E/10 | SOQUEM INC. | M.A.D. | Au | S(8:2480),Mag |
| 83 | Noyelles/ Berthiaume | 1C-1 | 32F/11 | Syndicat Berthiaume/ SOQUEM INC. | Noyelles | Au | Mag,TBF,Pr |
| 84 | Pascalis | 1C-5 | 32C/03 | Exploration Aubut | Pascalis | Au | Pr |
| 85 | Pascalis/ Louvicourt | 1C-5 | 32C/03 | Globex | Louvicourt East | Au,Cu,Zn | S(1:150) |
| 86 | Perron/Rousseau | 1C-1 | 32E/03 | Ressources Coleraine | Normétal | Au,Cu,Zn | S(1:250),PP |
| 87 | Perron | 1C-1 | 32E/03 | Ressources Coleraine | Perron | Au,Cu,Zn | S(9:1500),PP,Gc(t),T |
| 88 | Pershing | 1C-5 | 32C/03 | Y. Lemieux | Busmac | Au | T,G,Gc(ro) |
| 89 | Pouchot | 1C-1 | 32F/11 | E. Bay | Elizabeth Bay | Pt,Pd,Au | Gp,T |

**TABLE 1C-1 – (cont'd)**

| N° | TOWNSHIP | FIG. | NTS | COMPANY | PROJECTS | SUBSTANCE | WORK[1] |
|---|---|---|---|---|---|---|---|
| 90 | Pouchot/Morris | 1C-1 | 32F/11 | Noranda | Pouchot | Au | Mag,EM,G |
| 91 | Privat | 1C-1 | 32D/10 | P. Létourneur | PL299 | Au,Cu,Zn | T,G,Gc(ro),PP |
| 92 | Quevillon/ Tonnancourt | 1C-1 | 32C/04 | Cameco Gold | Cedar Rapids | Au | S(8:2205),Gc(s) |
| 93 | Rochebaucourt | 1C-1 | 32C/11 | R. Lanthier | Duquette | Au | G,Gc(ro) |
| 94 | Rohault/ La Dauversière | 1C-1 | 32G/08 | Ressources Meston | Mine Joe Mann | Au | S |
| 95 | Roquemaure/ Duparquet | 1C-4 | 32D/11 | P. Letourneur | Groupe Hunter Mine | Au,Cu,Zn | Pr |
| 96 | Rouyn/ Beauchastel | 1C-4 | 32D/03 | Ressources Yorbeau | Astoria | Au | Pr,ET |
| 97 | Rouyn | 1C-4 | 32D/03 | Cambior | Routhier | Au | G,PP |
| 98 | Rouyn | 1C-4 | 32D/02 | SOQUEM INC./Thundermin | Lac Pelletier | Au | ET |
| 99 | Urban | 1C-1 | 32G/04 | Urbana Corporation | Macho River | Au,Cu,Zn | Mag,TBF,EM |
| 100 | Urban | 1C-1 | 32G/04 | Noront Res./Alto Min./ Inmet | Windfall Lake | Au | S(21:6900) |
| 101 | Urban/Barry | 1C-1 | 32G/04 | Teck/Ress. Murgor/ Freewest | Res./Inmet | Murgor | Au,Cu,Zn PP |
| 102 | Urban | 1C-1 | 32G/04 | Inmet/Alto Minerals | Alto Alcane | Au,Cu,Zn | S(4:1160),EM |
| 103 | Urban | 1C-1 | 32G/04 | Inmet/Noront Res./Alto Min. | Alto Noront | Au,Cu,Zn | S(17:5770),DPEM,EM |
| **104** | **Vassan/ Dubuisson** | **1C-5** | **32C/04** | **Mines Western Quebec** | **Wesdôme** | **Au** | **EF** |
| 105 | Vauquelin | 1C-5 | 32C/03 | Ressources Yorbeau | Vaupu | Au,Cu,Zn | PP,ET |
| 106 | Verneuil | 1C-1 | 32F/02 | SOQUEM INC./Normabec | Verneuil | Au | T,Gc(ro) |
| 107 | Vezza/Douay | 1C-3 | 32F/12 | SOQUEM INC./Jonpol/ Perrex/Bradshaw | Jonpol (1146) | Au | S(2:672) |
| 108 | Villemontel | 1C-4 | 32D/09 | J. Frigon/G. Robert | Faille Porcupine-Manneville | Au,Cu,Zn | S(1:282),Mag |
| 109 | Louvicourt/ Vauquelin | 1C-5 | 32C/03 | Provenor | Louvicourt-Vauquelin | Au | S,PP,Mag |
| 110 | Urban/Barry | 1C-1 | 32G/04 | Provenor/Inmet | Urban-Barry | Au | S(19:1671) |

**1. EXPLORATION WORK LEGEND**

DPEM Electromagnetic survey
E Sampling
EF Feasibility or market study
EM Electromagnetic survey
ET Technical evaluation study
Ev Bulk sampling
G Geological survey
Gc Undefined geochemical survey
Gc(ho) Humus geochemical survey
Gc(l) Lake bottom geochemical survey
Gc(ro) Rock geochemical survey
Gc(ru) Stream geochemical survey
Gc(s) Soil geochemical survey
Gc(t) Till geochemical survey
Gp Undefined geophysical survey
GpA Airborne geophysical survey
Int. Sat. Satellite image interpretation
Mag Magnetic survey
PEM Pulse electromagnetic survey
PP Induced polarization survey
Pr Prospecting
S(nb:m) Diamond drilling (number: total metre)
Sc Reverse circulation drilling
T Trenching and stripping
TBF VLF electromagnetic survey
TM Metallurgical testing

**bold** Advanced-stage project
☐ MRN subsidized project

**TABLE 1C-2 – Base metals and vanadium exploration in the Abitibi and the Pontiac subprovinces in 1999.**

| N° | TOWNSHIP | FIG. | NTS | COMPANY | PROJECT | SUBSTANCE | WORK |
|---|---|---|---|---|---|---|---|
| P1 | Barraute, Fiedmont | 1C-2 | 32C/05 | Mines Abcourt - Noranda | Vendôme | Zn,Ag,Au,Cu | Gp,Gc,G,S |
| P2 | Barraute | 1C-2 | 32C/12 | Mines Abcourt | Abcourt/Barvue | Zn, Ag | TM |
| P3 | Bartouille | 1C-2 | 32C/14 | R. Valiquette | Rivière Bell | Cu,Zn,Au | Pr |
| P4 | Bearn | 1C-2 | 32D/16 | D. Cyr | Bearn | Cu,Zn,Au | Pr |
| P5 | Beschefer | 1C-3 | 32E/10 | SOQUEM INC/Métaux Billiton | Beschefer (1172-1) | Cu,Zn,Au,Ag | S(2:681),PEM |
| P6 | Beschefer | 1C-3 | 32E/15 | Métaux Billiton Canada | B-13 | Cu,Zn | Gp,PEM |
| P7 | Beschefer | 1C-3 | 32E/15 | Métaux Billiton Canada | SG-3 | Cu,Zn,Au | S(1:762),PEM,Gp |
| P8 | Bourlamaque | 1C-5 | 32C/04 | Ressources Aur | Auriac | Cu,Zn,Au | S(3:1965),PEM,Gc(ro) |
| P9 | Brouillan | 1C-3 | 32E/15 | SOQUEM INC/Métaux Billiton | Brouillan (B-26) | Cu,Zn,Au,Ag | G |
| P10 | Brouillan | 1C-3 | 32E/15 | Métaux Billiton Canada | P500 | Cu,Zn | S(6:1899),PEM |
| P11 | Carheil | 1C-3 | 32E/14 | Métaux Billiton Canada | D2 | Cu,Zn | S(2:763),PP,PEM |
| P12 | Carheil | 1C-3 | 32E/14 | Métaux Billiton Canada | SG-4 | Cu,Zn | S(1:396),PEM |
| P13 | Casa Berardi | 1C-3 | 32E/06 | Mines Cancor/Inco | Gemini | Cu,Pb,Zn,Ag, Au | S(20:8978),PEM,Mag, Gc(ro) |
| P14 | Cavelier | 1C-3 | 32F/12 | SOQUEM INC | Cavelier 1 | Cu,Zn,Au,Ag | Gp,G |
| P15 | Cavelier | 1C-3 | 32F/12 | SOQUEM INC | Du Dôme | Cu,Zn,Au,Ag | Pr,Gp |
| P16 | Cavelier, Desmazures | 1C-3 | 32F/12 | Noranda/Phelps Dodge Corp. Canada | Phelps Dodge 2 | Zn,Cu,Ag | PP, Pr |
| P17 | Chaste | 1C-2 | 32F/04 | D. Cyr | Coigny (volet VMS) | Cu, Ni | Pr |
| P18 | Clércy | 1C-4 | 32D/07 | Cambior | Kino-Dufresnoy | Cu,Zn,Au | S(3:1600),PEM,PP, Gc(ro),G |
| P19 | Dalet | 1C-3 | 32E/01 | Golsat Mining | Dalet | Cu,Zn,Au,Ag | Gp |
| P20 | Dalquier | 1C-2 | 32D/09 | P. Larivière | Dalquier Nickel | Ni,Au,Cu,Zn | S,G,Gc(ro) |
| P21 | Daniel | 1C-3 | 32F/13 | Noranda | Daniel 1 | Zn,Cu,Ag | S(2:1051),PEM,Gc(ro) |
| P22 | Daniel | 1C-3 | 32F/13 | Noranda/SDBJ | Daniel J.V. | Zn,Cu,Ag | S(1:732),Gc(ro),PEM |
| P23 | Denain | 1C-2 | 31N/14 | Moss Resources | Duval-Boudreault | Cu,Au | S,Tr,Pr,Gc(ro) |
| P24 | Desmazures | 1C-3 | 32E/09 | SOQUEM INC | SG1 | Cu,Zn,Au,Ag | S(1:951),PEM |
| P25 | Desmazures | 1C-3 | 32E/09 | SOQUEM INC | McIvor (B6-20) | Cu,Zn,Au,Ag | S(2:1184),PEM |
| P26 | Dufresnoy | 1C-4 | 32D/07 | Cambior | Bloc Dufault | Cu,Zn,Au,Ag | G,PP |
| P27 | Dufresnoy, Clércy | 1C-4 | 32D/07 | Cambior | Dufresnoy | Cu,Zn,Au,Ag | S(12:11000),Gc(ro),PEM |
| P28 | Duverny | 1C-2 | 32C/12 | B. Kowalski | Duverny | Cu,Zn,Ni,Au | Tr,G |
| P29 | Fénelon | 1C-3 | 32E/15 | Métaux Billiton Canada | B-18 | Cu,Zn | S(2:981), PEM |
| P30 | Fournière | 1C-5 | 32D/01 | Exploration Malartic-Sud | Fournière | Cu | Pr |
| P31 | Galinée | 1C-3 | 32F/12 | Noranda | Bracemac | Cu,Zn,Au,Ag | S(2:1817),PEM,Gc(ro) |
| P32 | Galinée | 1C-3 | 32F/12 | Noranda | Galinée 8 | Zn,Cu,Ag | S(1:320),PEM,Gc(ro) |
| P33 | Gamache, Rohault | 1C-2 | 32G/08 | L. Girard | Chirstina | Cu,Zn,Au,Ag | Pr |
| P34 | Grevet | 1C-2 | 32F/02 | Cambior | Grevet-Mountain | Zn,Cu | S(1:760),PEM,G |
| P35 | Grevet | 1C-2 | 32F/02 | Cambior | Mine Gonzague-Langlois | Zn,Cu,Au | S(?:700),G |
| P36 | Grevet | 1C-2 | 32F/07 | T. Coyle | Le Feu | Zn,Cu,Au | Pr |
| P37 | Guercheville | 1C-1 | 32G/11 | Phelps Dodge Corp. Canada | Opawica | Cu,Zn | Mag,Pr,Gp |
| P38 | Joannes, Bousquet | 1C-4 | 32D/07 | Inmet | Joannes-Orion | Cu,Zn,Au | S(4:2000),PEM,Pr |
| P39 | Joutel | 1C-3 | 32E/08 | SOQUEM INC | Scodnard | Cu,Zn | G |
| P40 | Joutel, Poirier | 1C-3 | 32E/08 | SOQUEM INC/ Ressources Orient | Joutel-West | Cu,Zn,Au,Ag | G |
| P41 | Joutel, Poirier | 1C-3 | 32E/08 | Explo-Zinc | Kistabiche-Ez | Cu,Zn | G,T |
| P42 | Joutel | 1C-3 | 32E/08 | Kernow Resources | Joutel | Cu,Au | G |
| P43 | Joutel, Poirier | 1C-3 | 32E/08 | Globex Mining | Mine Poirier | Cu,Zn,Au,Ag | G |
| P44 | Laberge, Collet | 1C-3 | 32E/06 | Noranda | Collet-Laberge | Zn,Cu,Au,Ag | Gp,Mag,Pr |
| P45 | La Corne | 1C-5 | 32C/05 | AAA EXPL'OREMINES | Rosi | Cu,Ni | G,S,Gc,ET |
| P46 | La Dauversière, Queylus | 1C-2 | 32G/09 | Teck Exploration/ G. McCormick | PLD | Zn,Cu,Au,Ag | Gp,Mag,Gc(ro) |

**TABLE 1C-2 – (cont'd)**

| N° | TOWNSHIP | FIG. | NTS | COMPANY | PROJECT | SUBSTANCE | WORK |
|---|---|---|---|---|---|---|---|
| P47 | La Dauversière, Charron | 1C-2 | 32G/09 | R. Simard | Lac Dufresne | Zn,Cu,Au,Ag | Tr,Pr |
| P48 | La Gauchetière | 1C-3 | 32E/16 | Mines Agnico-Eagle | La Gauchetière PN-84 | Cu,Zn,Au | S(4:1418),Mag,PP |
| P49 | La Gauchetière, Desmazures | 1C-3 | 32E/09 | Noranda/South Africa Minerals | Caber | Zn,Cu,Ag | S(45:31499),PEM,PP |
| P50 | La Gauchetière | 1C-3 | 32E/16 | Noranda/Phelps Dodge Corp. Canada | Phelps Dodge 1 | Zn,Cu,Ag | S(2:1908),PEM,Gc(ro) |
| P51 | La Morandière | 1C-2 | 32C/12 | R. Tremblay | Rhyolite Hill | Cu,Zn | S(1:250) |
| P52 | La Morandière | 1C-2 | 32C/12 | J. Frigon/G. Robert | La Morandière | Cu,Zn | Mag,Gp |
| P53 | Landrienne | 1C-2 | 32C/05 | Corporation Minière Inmet | Landôme | Cu,Zn | S(6:4260),PEM |
| P54 | Lemoine | 1C-2 | 32G/16 | Cambior/McKenzie Bay Resources | Lac Doré | Vanadium | Mag,G,Gc(ro) |
| P55 | Lemoine, Rinfret | 1C-2 | 32G/16 | Teck Corporation/Loubel Exploration | Lemoine | Cu,Zn,Au,Ag | PEM,Gc(ro),G |
| P56 | Levis | 1C-2 | 32G-15 | J. Gadoury | Levis | Zn,Cu,Au,Ag | Pr |
| P57 | Louvicourt | 1C-5 | 32C/03 | Ressources Aur/ Tech Exploration/ Novicourt | Mine Louvicourt | Cu,Zn,Au,Ag | (S(30:14800),PEM, Gc(ro) |
| P58 | Louvicourt | 1C-5 | 32C/04 | Ressources Aur/ Tech Exploration/ Novicourt | Louvex | Cu,Zn,Au,Ag | S(5:3765),PEM,Gc(ro) |
| P59 | Louvicourt | 1C-5 | 32C/03 | Ressources Aur | Louvex-Sud | Cu,Zn,Au | S(5:3682),PEM,Gc(ro) |
| P60 | Louvicourt | 1C-5 | 32C/03 | Ressources Aur | Courageous | Cu,Au | Gp,PP |
| P61 | Louvicourt | 1C-5 | 32C/03 | Ressources Aur | Sleepy Lake | Cu,Zn,Au | S(?:7558),PEM, Gc(ro) |
| P62 | Louvicourt | 1C-5 | 32C/03 | Ressources Aur | Lugold | Cu,Zn,Au | S(?:1735),PEM,Gc(ro) |
| P63 | Louvicourt | 1C-5 | 32C/03 | Ressources Aur/ Beaufield Consolidated | Mainstreet | Cu,Zn,Au | S(1:99),PEM,Gc(ro) |
| P64 | Louvicourt, Bourlamaque | 1C-5 | 32C/04 | Ressources Aur | Compilation | Cu,Zn,Au | G |
| P65 | Montbray | 1C-4 | 32D/06 | Poirier-Leith | Leith A2 | Cu,Zn, Au,Ag | PP,T,Gc(s) |
| P66 | Morris, Pouchot | 1C-2 | 32F/11 | Noranda | Morris | Zn,Cu,Au,Ag | Gp |
| P67 | Quévillon | 1C-2 | | B. Osborne | Quévillon | Cu,Au | G |
| P68 | Subercase | 1C-3 | 32E/16 | Métaux Billiton Canada | B-31 | Cu,Zn, Au | S(1:405),PP,PEM |
| P69 | Ste-Hélène | 1C-3 | 32E/16 | SOQUEM INC | Samson | Cu,Zn,Au | S(2:609),PP |
| P70 | Urban | 1C-2 | 32G/04 | Inmet/Ressources Murgor | Windfall (volet VMS) | Cu,Zn,Au,Ag | Gp |
| P71 | Valrennes, Joutel | 1C-3 | 32E/09 | Teck Exploration/ Breakwater Res. | Valrennes | Cu,Zn,Ag | S(4:860) |
| P72 | Vassan | 1C-5 | 32C/04 | Noveder | Abitibi | Ni,Cu,Zn | G |
| P73 | Vassan | 1C-5 | 32C/04 | A. Gaulin | Alberto | Cu, Au | Gp, Mag |

**1. EXPLORATION WORK LEGEND**

| | | | |
|---|---|---|---|
| DPEM | Electromagnetic survey | Gp | Undefined geophysical survey |
| E | Sampling | GpA | Airborne geophysical survey |
| EF | Feasibility or market study | Int. Sat. | Satellite image interpretation |
| EM | Electromagnetic survey | Mag | Magnetic survey |
| ET | Technical evaluation study | PEM | Pulse electromagnetic survey |
| Ev | Bulk sampling | PP | Induced polarization survey |
| G | Geological survey | Pr | Prospecting |
| Gc | Undefined geochemical survey | S(nb.m) | Diamond drilling (number, total metre) |
| Gc(h) | Humus geochemical survey | Sc | Reverse circulation drilling |
| Gc(l) | Lake bottom geochemical survey | T | Trenching and stripping |
| Gc(ro) | Rock geochemical survey | TBF | VLF electromagnetic survey |
| Gc(ru) | Stream geochemical survey | TM | Metallurgical testing |
| Gc(s) | Soil geochemical survey | | |
| Gc(t) | Till geochemical survey | **bold** | Advanced-stage project |
| | | ☐ | MRN subsidized project |

# 1D
# New Québec and Torngat Orogens, Rae Province (Far North Craton) and Ungava Trough

Serge Perreault

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Magmatic Cu-Ni-Co-PGE and Cr-Ni deposits ..... 26
Stratiform, sedimentary Cu and Zn-Cu-Au-Ag+/-Pb deposits ..... 26
Diamonds ..... 26
Ungava Trough ..... 27
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The New Québec (Labrador Trough) and the Ungava (Ungava Trough) orogens are located in northern Quebec (figures 1D-1, 1D-2a and b). These two Paleoproterozoic orogenic belts are part of the Churchill Province and border the Superior Province to the east and north. The Rae Province is located between the New Quebec Orogen to the west and the Torngat Orogen to the east (figure 1D-1). It is composed of Archean and Paleoproterozoic rocks. The New Quebec Orogen, better known as the Labrador Trough, is an orogenic belt composed of folded volcano-sedimentary rocks with south-west vergence, lying on the north-east margin of the Archean Superior Province. It extends N-S over about 360 km in New Québec. The Ungava Orogen, also known as the Ungava Trough or Cape Smith belt, is located in the northern extremity of the New Québec peninsula. It is a volcano-sedimentary belt extending over 370 km in a WSW-ENE direction (figure 1D-2a) limited to the south by the Archean Superior Province.

In 1999, exploration investment in the Labrador Trough and the Rae amounted to $1.89 M ($2.33 M in 1998). During 1999, off-mining-site exploration investment reached $9.49 M ($8 M in 1998) in the Ungava Trough. **Société minière Raglan** (a 100 %-owned subsidiary of **Falconbridge**) continued production at its Raglan project, according to plan.

## New Québec Orogen, the Rae Province (Far North Craton) and Torngat Orogen

### MAGMATIC CU-NI-CO-PGE AND CR-NI DEPOSITS

**Osisko Exploration** (1; figure 1D-1) and its partner **Virginia Gold Mines** continued their exploration program over the north end of the New Québec orogenic belt. The property comprises a mafic to ultramafic complex stretching over 16 km. **Osisko** has found more than ten disseminated to massive sulphide showings. Some of these, located at the base of peridotite bodies in Qarqasiaq and Tasikutaak units, reach 100m in length. Grab samples have returned up to 6.50 % Ni and 0.34 % Co. Average values made public by the company are: 3.60 % to 6.25 % Ni, 0.09 % to 0.22 % Cu and 0.18 % to 0.33 % Co for 3 massive sulphide zones and 0.53 % to 1.18 % Ni, 0.14 % to 0.40 % Cu and 0.03 % to 0.07 % Co for 3 disseminated sulphide zones associated with the Qarqasiaq unit. The company also published values ranging between 0.36 % and 1.11 % Ni, 0.28 % and 0.95 % Cu, 0.0 8 % and 0.18 % Co for 5 massive sulphide zones and from 0.28 % to 0.54 % Ni, 0.22 % to 0.36 % Cu and 0.03 % to 0.04 % Co for disseminated zones in the Tasikutaak unit. In 1999, the partners conducted an airborne geophysical survey as well as shallow drilling.

In the Quartaq area (NTS 25D), **SOQUEM INC** and **Cambior** (5; figure 1D-1) carried out a helicopter-borne Mag-EM survey. The objective was to find Cu-Ni mineralization associated with mafic and ultramafic rocks.

In the Kuujjuaq area, prospectors from the **Nunavik Mineral Exploration Fund** (4; figure 1D-1) found copper and nickel anomalies associated with ultramafic rocks and gabbros. **Dumont Nickel Inc.** (4; figure 1D-1) evaluated Cu-Ni properties associated with gabbros and tholeiites in the Labrador Trough.

In the Rae, **Cambior** and the **Nunavik Mineral Exploration Fund** (6; figure 1D-1) carried out geological reconnaissance work east of the George River. These companies are seeking Cu-Ni-Co-PGE deposits associated with ultramafic rocks of the Lake Harbour Group.

### STRATIFORM, SEDIMENTARY CU AND ZN-CU-AU-AG+/-PB DEPOSITS

**Noranda** Inc. (3; figure 1D-1) drilled 7 holes (1,684 m) on the Kan property (acquired from Kennecott Exploration). Numerous Zn-Cu-Au-Ag+/-Pb showings, including the Kan deposit are found on the property in pelitic sandstones of the Baby Formation. The Kan deposit is of Besshi-type, a variety VMS type in which the sedimentary rocks dominate over volcanic rocks. **Dumont Nickel Inc.** (4; figure 1D-1) investigated some properties containing Besshi-type mineralization.

The **Nunavik Mineral Exploration Fund** (7; figure 1D-1) continued exploration work on marble horizons of the Lake Harbour Group in the Keglo Bay area. The "Fund" was looking for Mississippi Valley-type (Zn-Pb-Cu-Ag) mineralization.

### DIAMONDS

In the fall of 1999, **Twin Gold Corporation** (8; figure 1D-1) issued press releases announcing the discovery of more than 250 diamonds from 3 kimberlite dikes, the Torngat-1, Torngat-2 and Torngat-3 dikes. The dikes are located on the eastern shore of the Abloviak fjord, 110 km east of Kangiqsualujjuaq on the east coast of Ungava Bay. These dikes were discovered during a mapping survey in the summer of 1991 (N. Goulet, personal communication, 1999). Digonnet (1997) identified these dikes as kimberlites and found a 0.5 mm diamond in a 30 kg sample.

Three dikes, striking NE-SW, are diamond-bearing. The Torngat-1 dike is 2.5 m in thickness and can be followed for more than 1.5 km. The Torngat-2 dike has a thickness of 1m while the Torngat-3 dike is 60 cm thick. They were intruded into sillimanite-garnet gneiss of the Tasiuyak Gneiss unit. The dikes are found in a 300 m high cliff. Initialy, 26 diamonds were recovered from a 10.8 kg sample from the Torngat-2 and 3 dikes, taken from rubble at the base of the cliff. Following these results, Twin Gold announced that 112 diamonds were recovered from a 212 kg kimberlite sample from the Torngat-1 dike. Thirteen of the diamonds were macro-diamonds, i.e. their maximum dimension was more than 0.5 mm, and the largest was 1.65 mm in size.

Twin Gold also sampled a total of 366 kg of kimberlitic material from 5 location in the Torngat-1 dike. Caustic fusion extraction recovered 326 diamonds, including 57 macro-diamonds. From one of the locations, the company collected 244 kg of fine-grained kimberlite from the margins of the dike. This sample returned only 17 micro-diamonds. However, a coarse-grained kimberlite sample from the center of the dike returned 214 diamonds including 44 macro-diamonds. Eight of the diamonds exceeded 1 mm in size. From this sample, 183 diamonds were classified as white, 23 as off-white, 7 as gray and one as brown. Of these 214 diamonds, 176 were transparent, 37 were translucent and one was opaque. The company reported, from a limited sampling, a ratio of 2 diamonds per kg of kimberlite. Twin Gold has also discovered another kimberlite dike swarm, 10 km to the south-west of the Abloviak fjord, at the mouth of the Baufremont River. Seven micro-diamonds were recovered from a 27.5 kg sample from one of these dikes.

Since the end of September 1999, 26 mining exploration permits (PEM) have been issued in the Abloviak fjord area, following Twin Gold's announcements. Marum Resources, Dumont Nickel, Band-Ore Resources, International Tower Hill, 737 142 Alberta, P. Ferderber and J.-P. Cloutier have acquired exploration permits in the area.

## Ungava Trough

After investing close to $500 M, the **Société minière Raglan** (figure 1D-2a and b), a 100 %-owned subsidiary of **Falconbridge**, reached its 1999 production objectives at the Raglan nickel and copper mine. With the Raglan mine, Falconbridge should increase its nickel production by nearly 50 %. The company foresees a 25 year mine life with an annual production of 21,000 tonnes of nickel concentrate, 5,000 tonnes of copper concentrate and 200 tonnes of cobalt concentrate. Production costs are estimated at about $1.50/lb Ni. The **Société minière Raglan** is mining, by means of an open pit and underground stopes, several massive sulphide lenses at the base of ultramafic flows in the Chukotat Group. Reserves at Raglan (including the Cross lake, Katinik and Donaldson deposits) are estimated at 22 Mt at an average grade of 3.12 % Ni and 0.87 % Cu. The 1998 drilling campaign increased the mineral resources of Raglan by 1.8 Mt, with the discovery of a new mineralized lens in the west part of the property. This year, **Falconbridge** Ltd. (9; figure 1D-2a) continued its exploration program by carrying out geophysical surveys and drilling. The company concentrated its efforts at the contact between the Povungnituk and Chukotat groups, in the eastern part of the Ungava Belt. This work has led to the discovery of new mineralized zones.

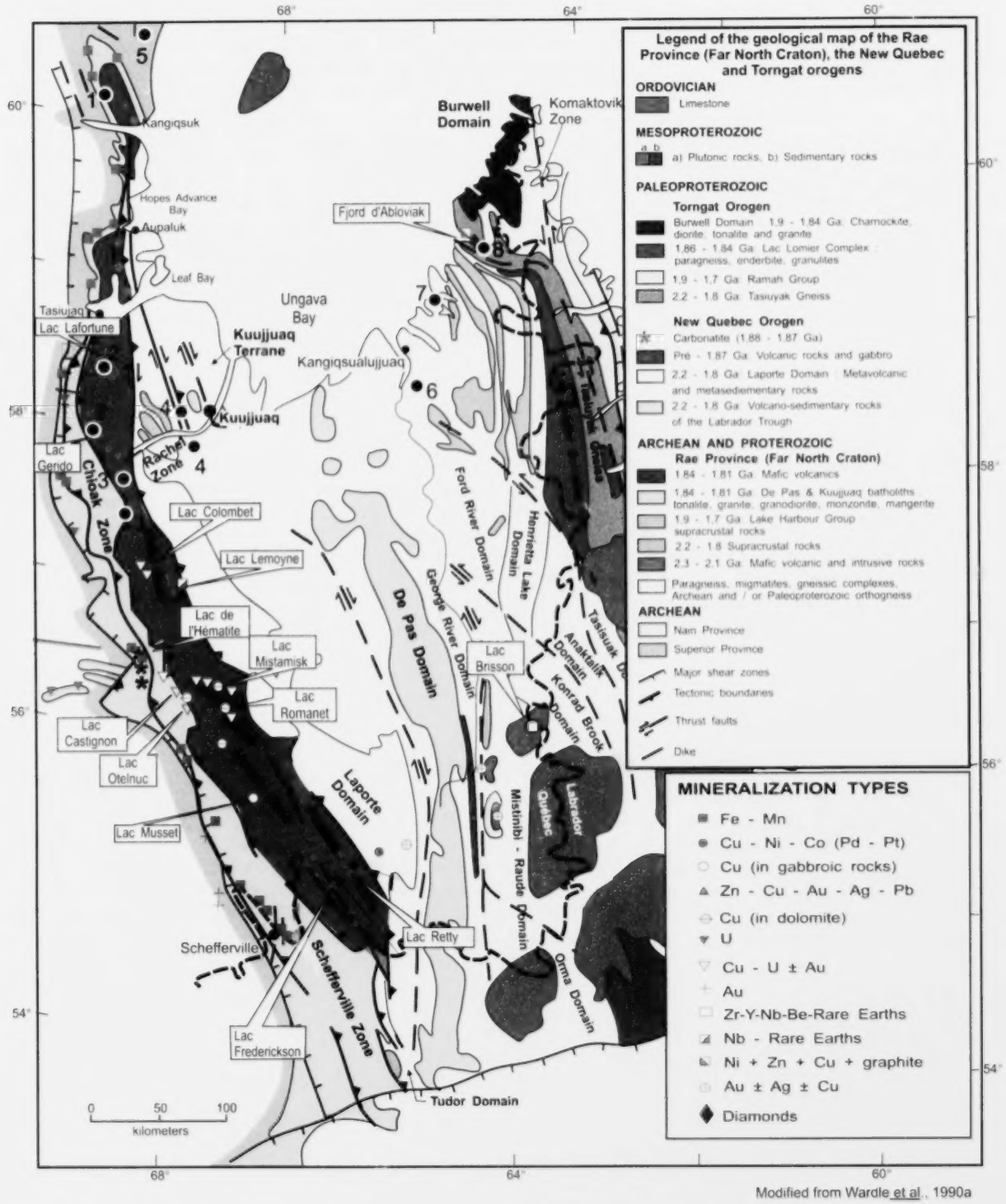
**Dumont Nickel** and **HDG Raglan Exploration** (11; figure 1D-2a) continued their exploration work with their Lac Raglan and Shoot Out projects. The companies are exploring for Ni-Cu-PGE deposits associated with peridotite horizons near the contact between the Chukotat and Povungnituk units and within the Povungnituk unit. The 1999 program included diamond drilling on targets identified in 1998, geophysical surveys (helicopter-borne Mag-EM, Max-Min, etc.), soil and lithogeochemical surveys, prospecting and geological surveys. However, no significant results were obtained.

**SOQUEM INC** (10; figure 1D-2a) conducted exploration work on the Nuvilik project, optioned from Falconbridge Ltd. **SOQUEM INC** is looking for SEDEX or VMS-type Zn deposits in the volcano-sedimentary sequence.

The **Nunavik Mineral Exploration Fund** (12; figure 1D-2a) carried out exploration work in the west end of the Ungava Trough. This was part of the prospector development program for the Inuit communities. The "Fund" was looking for gold and base metal showings.

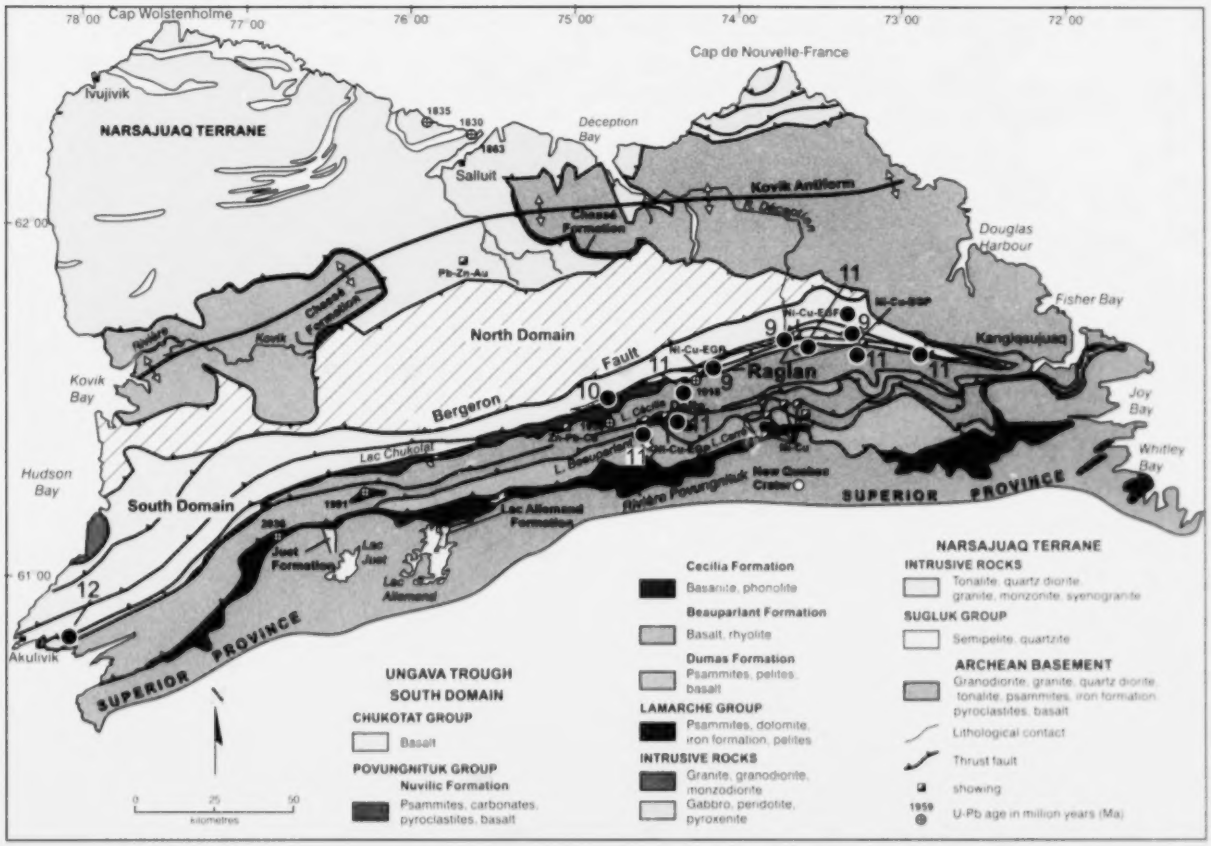
## Outlook

In 2000, off-mining-site exploration expenditures should remain at the same level as in 1999 in the New Québec and the Ungava orogenic belts. Main activities will be searching for magmatic Ni-Cu-PGE and for VMS and SEDEX-type base metal deposits, as well as diamonds. The Abloviak fjord area, in the eastern part of the Ungava Bay, will be quite active next summer. Several companies will be exploring for diamonds in this area.




Modified from Wardle et al., 1990a

**FIGURE 1D-1** – Localization of 1999 mining exploration projects for the New Quebec and Torngat orogens and for the Rae Province (Far North Craton).



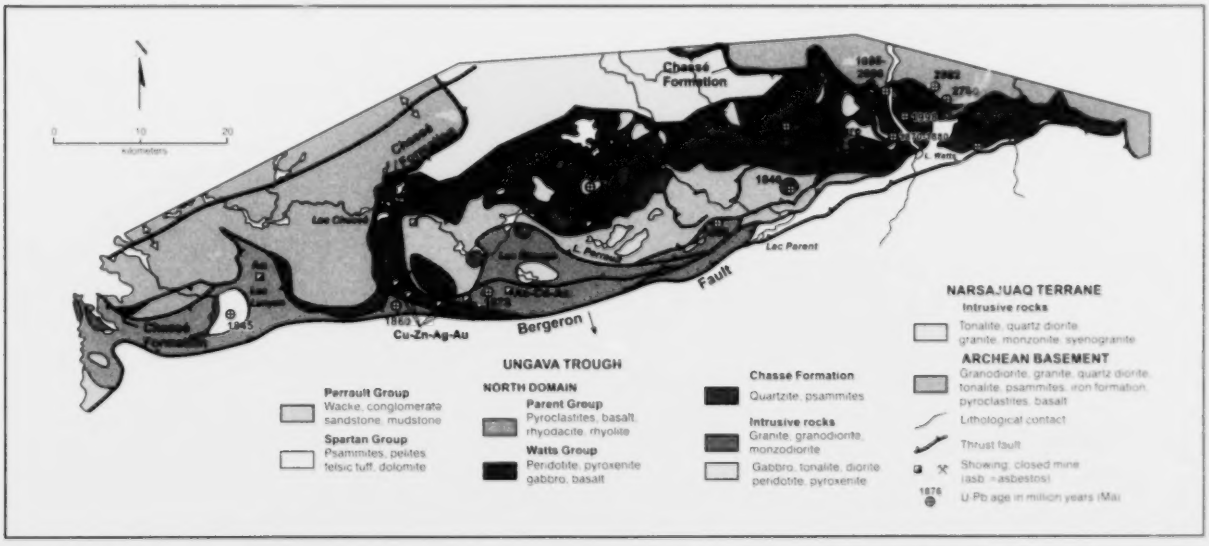




**FIGURE ID-2 a and b** – Localization of 1999 mining exploration projects for the Ungava Trough (a) and the North Domain (b).

**TABLE 1D-1 – Mining exploration projects in the New-Quebec Orogen, in the Rae Province (Far North Craton) and the Ungava Trough in 1999.**

| N° | TOWNSHIP | NTS | COMPANY | PROJECT | SUBSTANCE | WORK[1] |
|---|---|---|---|---|---|---|
| **New Quebec Orogen (see figure 2D-1 for project location)** | | | | | | |
| 1 | | 25D/01 | Osisko Exploration / Mines d'Or Virginia | Payne Bay | Ni, Cu, Co, EGP | G, Pr, GpA, S(4:200) |
| 2 | | 24F/13, 24K/05 | Dumont Nickel Inc. | Soucy, Chrysler, Prud'homme | Cu, Zn, Au, Ni, EGP | Pr, G |
| 3 | | 24F/06, 24F/11 | Noranda Inc. | Kan | Zn, Cu | Pr, G, Gp, Mag S(7:1684) |
| 4 | | 24F, 24K | Fond d'exploration minière du Nunavik | Kuujjuaq | Ni, Cu, | Pr, Gc(ro) |
| 5 | | 25C | SOQUEM INC, Cambior | Quartaq | Ni, Cu, Co | GpA, Mag |
| | | *(N.B. Project 5 location, on figure 1D-1, is north of the map boudary)* | | | | |
| **Rae Province (see figure 2D-1 for project location)** | | | | | | |
| 6 | | 24I | Cambior, Fond d'exploration minière du Nunavik | Ungava | Ni, Cu, Co | G, Pr, Gp, E |
| 7 | | 24P/04 | Fond d'exploration minière du Nunavik | Keglo Bay | Zn, Pb | Pr, Gc(ro), Gc(ru) |
| 8 | | 24P/06, 24P/07, 24P/11 | Twin Gold | Torngat | Diamant | Pr, G, E |
| **Ungava Trough (see figure 2D-2 a) and b) for project location)** | | | | | | |
| 9 | | 35G/09, 35H11, 35H/12 | Falconbridge | Raglan * | Ni, Cu, EGP | G, Gp, EM, DPEM, Mag, S(?:40080 m) |
| 10 | | 35G | SOQUEM INC, Falconbridge | Nuvilik | Zn | G, Pr, Gc(s) |
| 11 | | 35G/07, 35G/08, 35H/09, 35H/10, 35H/11, 35H/14 | Dumont Nickel Inc., HDG Raglan Exploration | Lac Raglan | Ni, Cu | G, Pr, GpA, Gp, Mag, EM, Gc(ro), S(13:2597) |
| 12 | | 35C/13 | Fond d'exploration miniere du Nunavik | Akulivk | Au, Cu, Zn, Ni | Pr, Gc(ro) |

1. EXPLORATION WORK LEGEND

| | | | |
|---|---|---|---|
| DPEM | Electromagnetic survey | Gp | Undefined geophysical survey |
| E | Sampling | GpA | Airborne geophysical survey |
| FF | Feasibility or market study | Mag | Magnetic survey |
| EM | Electromagnetic survey | PEM | Pulse electromagnetic survey |
| ET | Technical evaluation study | PP | Induced polarization survey |
| Ev | Bulk sampling | Pr | Prospecting |
| G | Geological survey | S(nb:m) | Diamond drilling (number: total metres) |
| Gc | Undefined geochemical survey | Scr | Reverse circulation drilling |
| Gc(h) | Humus geochemical survey | T | Trenching and stripping |
| Gc(l) | Lake bottom geochemical survey | TBF | VLF electromagnetic survey |
| Gc(ro) | Rock geochemical survey | TM | Metallurgical testing |
| Gc(ru) | Stream geochemical survey | * | Mine site exploration work |
| Gc(s) | Soil geochemical survey | Envir | Environmental restauration work |
| Gc(t) | Till geochemical survey | | |
| ☐ | MRN subsidized project | | |

# 1E
# Grenville Province

Roch Gaudreau
Serge Perreault

Nickel-copper-cobalt-platinum group element mineralization ..... 32
Gold and polymetallic (copper, zinc, gold, silver) mineralization ..... 32
Copper-iron and rare earth element mineralization ..... 33
Vanadium-titanium-magnetite and apatite mineralization ..... 33
Iron and ilmenite mineralization ..... 33
Niobium mineralization ..... 33
Outlook ..... 33

In 1999, approximately $1.82 M was spent on off-mining-site exploration in the Grenville Province, compared to $4.75 M in 1998. This dramatic decrease in expenditures was caused by the low market value of base and precious metals and by the difficulty of raising money for exploration programs by junior companies. Nevertheless, several types of mineralization were explored for in 1999 in the Grenville.

## NICKEL-COPPER-COBALT-PLATINUM GROUP ELEMENT MINERALIZATION

In the Saguenay-Lac St. Jean area, **Virginia Gold Mines** and **SOQUEM INC** continued exploration over a vast troctolite complex of more than 1000 km² in the Chutes-des-Passes area (23; figure 1E-1). Drill holes intersected several mineralized lenses (centimeter- to meter-size) within layered sequences. The best drill intersections on the Paul and Manouane grids were respectively 1.28 % Ni, 0.69 % Cu and 0.09 % Co over 0.33 m and 1.18 % Ni and 0.1 % Co over 1.66 m. West of Lac St. Jean, prospector **Bernard Sénéchal** carried out prospecting and geophysical work on his Bethoveen property, located in Desautels Township (58; figure 1E-1). A trench was excaved in a sulphide showing grading up to 1 % Ni and 0.1 % Cu, associated with a km-size zone of mafic to ultramafic rocks whose composition varied from pyroxenitic gabbro to pyroxenite.

In the Outaouais area, **Falconbridge** conducted an helicopter-borne Mag-EM geophysical survey to evaluate the Ni-Cu potential of the St. Marie property, located in Hincks Township (29; figure 1E-1). Grenville Province Central Metasedimentary Belt metasediments, intercalated with mafic and ultramafic intrusions, characterize the area.

In the Lanaudière area, prospector **Phil Boudrias** discovered a massive sulphide showing on his Taureau Reservoir property, located in Brassard and Masson Township (34; figure 1E-1). The area is underlain by a km-size gabbro intrusion, intruding in sulphide-bearing metasediments. A grab sample of the massive sulphides returned 4.22 % Ni, 0.07 % Cu, 0.49 g/t Pd and 0.25 g/t Pt.

In the Côte-Nord area, **Virginia Gold Mines** and the **FREM** (Fonds régional d'exploration minière) continued work on the B-20 property (93; figure 1E-1). The property hosts Cu-Ni-Co mineralization associated with pyroxenite horizons, lenses and bodies on the north margin of the Rivière-Pentecôte Anorthosite Suite. The best results obtained were 1.7 % Ni, 2.9 % Cu, 0.16 % Co, 0.4 g/t PGE and 0.5 g/t Au. In the Lac Manitou area, prospectors **M. Castilloux, B. Dallaire, A. Gauthier, D. Lemenan** and the **FREM** (102, 117; figure 1E-1) discovered a Cu-Ni-Co showing in a noritic facies located on the northeast margin of the Tortue Anorthosite Suite. Values of 2.46 % Cu, 0.69 % Ni and 0.16 % Co were reported. In the Lac Labrie area, prospector **C. Gauthier** and the **FREM** (95; figure 1E-1) found Cu-Ni mineralization associated with pyroxenite in a gabbronorite, which is probably correlative with the Rivière-Pentecôte Anorthosite Suite. Values of 5.6 % Cu and 0.3 % Ni have been reported. Prospectors **Claude** and **Robert Ouellet** (82; figure 1E-1), in partnership with the **FREM**, continued work on the Lucy Cu-Ni-Co showing located on the Manicouagan Plateau. The best values were 1.4 % Ni, 0.66 % Cu, 0.16 % Co and 600 ppb Pd. On the Manicouagan Plateau, **Falconbridge Ltd.** (81; figure 1E-1) initiated a new exploration project following the completion of a helicopter-borne Mag EM survey and ground prospecting.

## GOLD AND POLYMETALLIC (COPPER, ZINC, GOLD, SILVER) MINERALIZATION

In the Outaouais area, **Louvicourt Gold Mines** and **Prospecting Geophysics** continued their geophysical and geochemical exploration program to evaluate the potential for zinc in marble sequences and for polymetallic skarn deposits in the periphery of late intrusions (41; figure 1E-1).

In the Mauricie region, **Osisko Exploration** and **Troymin** Resources continued their work on the St. Maurice property, along an alteration corridor characteristic of volcanogenic massive sulphides (53; figure 1E-1). The region is underlain by a sequence of mafic to ultramafic intrusions crosscutting orthogneisses and sulphide-bearing paragneisses. A drill hole intersected a polymetallic zone containing 0.5 % Zn, 0.4 % Cu, 9.7 g/t Ag and 5.0 g/t Au over 1.77 m.

In the Québec City area, **Exploration Malartic-Sud** signed an agreement to acquire a property belonging to geologists **Jean Bernard, Marc Bannas and Christian Desrosiers** covering the south and west extension of the old **Muscocho** gold mine at Montauban, as well as the Grawmont zone, located 1 km west of Montauban. The 1999 exploration work consisted of drilling to verify the east limit of the South Zone and to confirm the extension and grade of the zone towards surface (38; figure 1E-1). The best drill results were 7.45 g/t Au, 11.2 g/t Ag and 0.5 % Zn over 1.42 m and 4.1 g/t Au and 51.2 g/t Ag over 5.9 m.

In the Côte-Nord area, prospector **G. Gallant** (109; figure 1E-1) discovered a copper and silver showing (1.3 % Cu, 37.2 g/t Ag, 0.1 % Mo, 0.46 % Bi) within quartz and granite veins crosscutting Wakeham Group amphibolite. **SOQUEM INC** (110; figure 1E-1) conducted a significant stripping program and an induced polarization geophysical survey over the Johan-Beetz property. **SOQUEM INC** optioned the Rust Cliff property located east of Johan-Beetz Bay from **P. Boudrias**. Exploration was aimed at Copper Belt-type mineralization and lode copper. A Cu-Au showing in quartzites, discovered in 1994, returned up to 18.29 % Cu, 1.85 g/t Au and 32 g/t Ag. In the Lac Brézel area, **SOQUEM INC** (99; figure 1E-1) conducted prospecting and geophysical surveys in the Manitou Complex paragneiss. Mineralization is in the form of disseminated sulphides and sulphide clusters in quartz-rich paragneiss. Values of 1.12 % Zn and 0.5 g/t Au were reported from the Canot showing.

### COPPER-IRON AND RARE EARTH ELEMENT MINERALIZATION

Prospecting work north of Sept-Îles in 1993 by **SOQUEM INC** and **IOC mining company**, led to the discovery of several Fe-Cu-REE-fluorite showings. These showings are associated with magnetite layers and skarns crosscutting granitic gneiss and felsic porphyry layers. The best results were 1.8 % Cu and 1 % REE over 9.4 m from channel sampling, 1.1 % Cu over 6.4 m, 0.6 % Cu and 1.5 % REE over 3.5 m and 0.3 % Cu over 62 m. This mineralization is similar to the Olympic Dam-type in Australia and to the Kiruna-type in Sweden. In 1999, **SOQUEM INC** (101; figure 1E-1) re-assayed some showings and carried out a ground spectrometric survey.

### VANADIUM-TITANIUM-MAGNETITE AND APATITE MINERALIZATION

Northeast of Chicoutimi, **Osisko Exploration** conducted work on its Buttercup vanadium property (11; figure 1E-1). The property is located on the margin of the the St. Fulgence Lobe of the Lac St. Jean Anorthosite Complex. The area is underlain by layered gabbroic anorthosite containing vanadium-rich titanium-magnetite cumulates. In the Montagnais block, a high-resolution airborne magnetic survey located an anomaly twice as strong and ten times as long as the anomaly over the adjoining Buttercup South deposit. Estimated geological resources at the Buttercup South deposit are 3.5 Mt of ore at 49 % Fe, 1 % $TiO_2$ and 0.67 % $V_2O_5$.

In their Chutes-des-Passes nickel-copper project in the Lac St. Jean area, **Virginia Gold Mines** and **SOQUEM INC** carried out reconnaissance mapping focussing on magnetic bands in an intrusive complex. This led to the discovery of several showings returning values between 6 and 14 % $P_2O_5$ and between 6 and 21 % $TiO_2$. Resampling of drill core identified a 118 m wide horizon with grades of 7.6 % $P_2O_5$ and 9. 7 % $TiO_2$ (23; figure 1E-1).

### IRON AND ILMENITE MINERALIZATION

In the Fermont area, **Quebec Cartier mining company** (89; figure 1E-1) continued a pre-feasibility study of its Bloom Lake iron deposit to the north of the Mont Wright mine. The company conducted bulk sampling, a large drill program and metallurgical studies of the iron ore.

**QIT Fer et Titane** (108; figure 1E-1) conducted geophysical (mag and gravimetry), geochemical and geological mapping surveys on the Grader South property. The ilmenite deposit is associated with the Havre-St-Pierre Anorthosite Suite.

### NIOBIUM MINERALIZATION

The St. Honoré carbonatite complex, in the Saguenay area, hosts the niobium deposit mined by **Teck Corporation** and **Cambior**. The Niobec mine ore is composed of pyrochlore, which is converted to ferro-niobium. In 1999, the companies completed a profitability study on the expansion of the mill concentrator at the Niobec Mine.

## Outlook

The reduction of exploration budgets of major companies in 1999 and the financing difficulties of junior mining companies, suggest that total off-mining-site exploration expenditures could decrease further in 2000 in the Grenville Province. However, strengthening of the nickel price on world markets could have a positive impact on exploration expenses related to this substance. While exploration has been centered on Ni-Cu-Co deposits since 1995, 1999 saw some diversification in exploration interest. It is anticipated that this diversification will continue in 2000, with a possible renewed interest for industrial minerals.

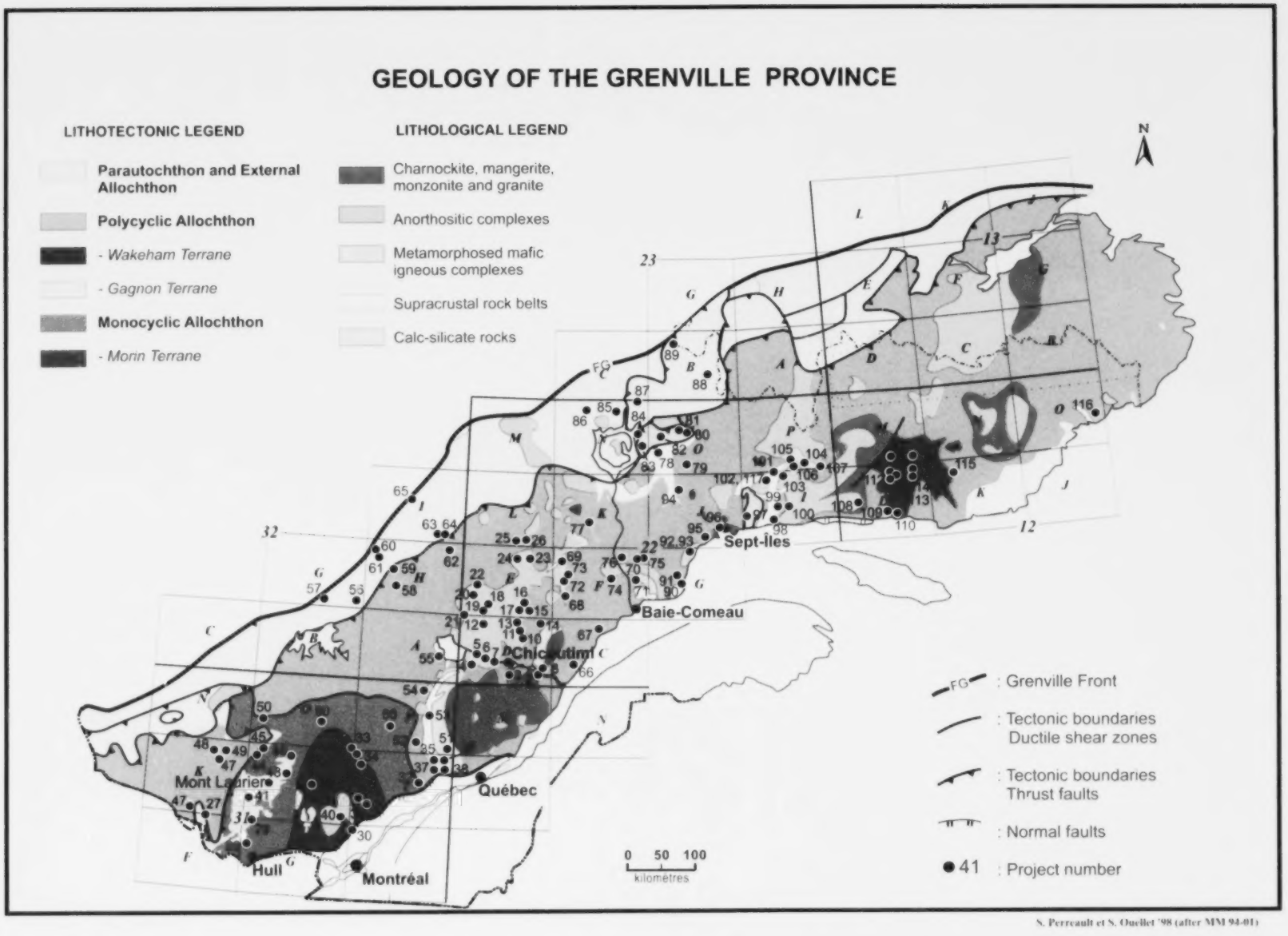



**FIGURE IE-1** - Localization of 1999 mining exploration projects in the Grenville Province.

**TABLE 1E-1 – Exploration work in the Grenville Province in 1999.**

| N° | TOWNSHIP | NTS | COMPANY/PROSPECTOR | PROJECT | SUBSTANCE | WORK[1] |
|---|---|---|---|---|---|---|
| 1 | — | 22 Ouest et 32 Est | Falconbridge Ltee | Reconnaissance Grenville ouest | Ni, Cu, Co, EGP | Pr, E, G |
| 2 | — | 22 ouest, 31 nord 32 sud-est | SOQUEM INC | Reconnaissance Grenville ouest | Cu-Ni-Zn-Au | Pr, E |
| 3 | Cimon | 22D/02 | Germain Boily | Mars-Moulin | Ni-Cu, Au | Pr, E |
| 4 | Mesy | 22D/05 | Jimmy Desgagnes | Projet Mesy | Ni-Cu | Pr, E |
| 5 | Kenogami | 22D/06 | Robert Gagnon | Nickel Hope | Ni-Cu | Pr, Gp, TBF, T |
| 6 | Kenogami | 22D/06 | Robert Gagnon | Lac Jerome 1 | Ni-Cu | Pr, E |
| 7 | Kenogami | 22D/06 | Lucien Girouard | Lac Jerome 2 | Ni-Cu | Pr, E, EM |
| 8 | Champigny | 22D/08 | Gervais Simard | Barycelest I | Ba, Nb | Pr, E |
| 9 | Hebert | 22D/08 | Charles Boivin | Eternité | Ni-Cu, Ti-P | Pr, E |
| 10 | Le Mercier | 22D/10 | Marcel St-Laurent | Oxides le marie | Ti-P | Pr, E |
| 11 | Garreau, Chastelin, Tremblay | 22D/10, 15 | Osisko Explo | Buttercup | V, Ti | GpA(Mag) |
| 12 | Rouleau | 22D/14 | Gerard Girard | Lac Laberge | Ni-Cu | Pr, Mag, TBF |
| 13 | Garreau | 22D/15 | Gaetan Tremblay | Vanadium | Vanadium | Pr, E |
| 14 | — | 22D/16 | Charles Auguste Girard | Lac de la croix | P-Ti | Pr, E |
| 15 | — | 22E/02 | Lionel Lefevre | Bobly | Ni-Cu | Pr, Mag |
| 16 | — | 22E/02 | Leopold Tremblay | Lac Beauchêne | V-Ti-P | Pr, E |
| 17 | — | 22E/02 | Leopold Tremblay | Ilmenite camp Sablon | Ti-P | Pr, Mag |
| 18 | — | 22E/03 | Gaetan Tremblay | Riviere Peribonka | Zn | TBF |
| 19 | — | 22E/03 | Charles Boivin | Poisson Blanc | Au | Pr, TBF |
| 20 | Primeau | 22E/04 | Denis Dufour | Nisques | Ni-Cu, Ti-P | Pr, E |
| 21 | Milot | 22E/04 | Michel Bouchard | Lac Long | Ni-Cu | Pr, E |
| 22 | Desrivieres | 22E/05 | Gaston Savard | Samen II | Ni-Cu | Pr, E |
| 23 | — | 22E/09, 10, 15 | Mines d'Or Virginia, SOQUEM INC | Chute des Passes | Ni-Cu-Co-EGP, Ti-P | G, Pr, E |
| 24 | — | 22E/15 | Christian Lefevre | Lac à Paul | Ni-Cu | Pr, E |
| 25 | — | 22L/02 | Jean-Jacques Boily | Bolav | Ni-Cu | Pr, E |
| 26 | — | 22L/02 | Michel Besbiens | Mickel-1999 | Diamant, Ni-Cu | Pr, E |
| 27 | Anjou, Brie, Gillies, Huddersfield, Pontefract | 31F/15, 31K/02 | Jean Phillipe | Duval-Coulonge | Au | Pr, E |
| 28 | Wakefield | 31G/12 | Michel Boulanger | Gatineau | P, Li | Pr, E |
| 29 | Hincks | 31G/13, 31J/04 | Falconbridge | Sainte-Marie | Ni | GpA(Mag-EM), Gc(s), Pr |
| 30 | Rawdon, Wexford, Abercramby | 31H/13 | David Frappier Rivard | Kilkenny | Cu-Ni-Co | Pr, E |
| 31 | Joliette | 31I/05 | Eric Ducharme | Ste-Emélie de l'Energie | Cu-Ni, Au | Pr, E |
| 32 | Shawinigan | 31I/10 | Jean Bernard, Arena Gold | Shawinigan | Cu-Ni-Co, Zn-Ag | G, Pr, E |
| 33 | Masson, Laviolette | 31I/13, 31J/16, 31O/01, 31P/04 | Marc Banas | Réservoir Taureau | Cu-Ni-Co-EGP, Au | Pr, G, E |
| 34 | Brassard, Masson, Crequy, De Maisonneuve, Laviollette | 31I/13, 31J/16, 31O/01, 31P/04 | Phil Boudrias | Reservoir Taureau | Ni-Cu-Co, EGP | Pr, E, T |
| 35 | Montauban, Perthuis | 31I/16 | Rémi Charbonneau | Nadeau | Ni-Cu-EGP | Pr, E, Gc |
| 36 | Grondine | 31I/16 | Jean Bernard | Saint-Thomas | Au-Ag, Zn-Pb | Pr, E |

**TABLE 1E-1 – (cont'd)**

| N° | TOWNSHIP | NTS | COMPANY/PROSPECTOR | PROJECT | SUBSTANCE | WORK[1] |
|---|---|---|---|---|---|---|
| 37 | Chavigny | 31I/16 | Roch Chartré | Lac-aux-Sables | Au-Ag, Zn-Pb | Pr, G, E |
| 38 | Montauban, Grondines ouest | 31I/16 | Exploration Malartic-Sud | Montauban sud | Au-Ag | Pr, E, S(6:300) |
| 39 | Cartier | 31I/05 | Luc Boulé | Cartier II | Cu-Ni-Co | Pr, E |
| 40 | Wexford, Chertsey, Chilton | 31J/01 | Mathieu Stephens | Wexford | Cu-Ni-Co | Pr, E |
| 41 | Bouchette, Cameron, Northfield, Wright | 31J/04, 05, 31K/01, 08 | Louvicourt Gold Mines, Prospecting geophysics | Maniwaki | Zn-Ag | Mag, Gc(s), Pr, G |
| 42 | Turgeon, Boyer, Mousseau | 31J/06, 07, 10, 11 | Falconbridge | Véronique | Ni-Cu | GpA(Mag-EM), Gc(s), Pr |
| 43 | Turgeon | 31J/11 | Paul Radermaker | Expo | Ni-Cu, Zn, Au | Pr, E |
| 44 | Fontbrune, Major | 31J/13 | Martin Sauvé | Baskatong | Au-Ag, Cu | Pr, E |
| 45 | Fontbrune | 31J/13 | Phillipe Allard | Lac Piscatosine | Au-Ag, Cu | Pr, E |
| 46 | Leman, Franchère | 31J/14 | Francise Audet | Frantung | W | Pr, E |
| 47 | Lyonnais, Hainaut, Esher, Sheen, Bryson, Pontefrac | 31K/02, 03, 06, 07, 10, 15 | Lev Vorobiev | Pythonga | Ni-Cu-Co-EGP | Pr, E |
| 48 | Waltham | 31K/15 | Bernard Charron | Lac Goghlam | Cu-Ni-Co, Zn | Pr, E |
| 49 | Hainault, Kondiaronk, Champagne, Orlénais | 31K/15, 16 | André Gauthier | Vulcain IVA | Ni-Cu-EGP | Pr, E, Gc, Gp |
| 50 | Laviolette, Harper, Bisaillon | 31O/05, 07, 31P/06, 31I/13 | David Fournier Viger | Lalonde | Diamant, Zn | Pr, Gc, E |
| 51 | Pothier, Lapeyrère | 31P/01 | Res. Appalaches, SOQUEM INC | Dussault | Zn-Cu-Au | ET |
| 52 | Hackett | 31P/02 | Sylvain Chapleau | Belchap | Au, Zn-Pb, Ni-Cu | Pr, E |
| 53 | Charest, Tourouvre | 31P/07, 08, 10 | Osisko Explo., Troymin Res. | Saint-Maurice | Au, Cu-Zn-Ag | EM, S(3:214) |
| 54 | Cadieux | 31P/15 | Bertrand Vigneault | Vigneault | Cu-Ni-Co | S, E, G |
| 55 | Dechêne | 32A/08 | Ghislain Gaudreault | Norcom | Zn-Cu-Au | Pr, E |
| 56 | Feuquières | 32G/01 | Larry Desgagné | Feuquières | Au-Ag, Cu | Pr, E |
| 57 | Bressani, Langloiserie, Chamballon, Pambrun | 32G/02 | Jean Viger, Phillipe Viger | Beaumier | Zn, Au, Diamant | Pr, E, Gc |
| 58 | Desautels | 32H/06 | Bernard Senéchal | Bethoveen VII | Ni-Cu | Pr, T, Mag, VLF |
| 59 | Aiguillon | 32H/11 | Bernard Senéchal | Bethoveen VI | Ni-Cu | Pr, E |
| 60 | Rinfret | 32H/13 | André Rinfret | Jamar II | Au-Cu | Pr, E |
| 61 | McCorkill | 32H/13 | Gervais Simard | Lac Nepton | Ni-Cu, Au | Pr, E |
| 62 | Hudon | 32H/16 | France Tremblay | Camp bureau | Ni-Cu, Ti-P | Pr, E |
| 63 | — | 32I/02 | Charles-Henri Laflamme | Lac Covel | Zn-Cu-Au | Pr, E |
| 64 | — | 32I/02 | Paul Gagnon | Lac Cauvet | Cu-Au | Pr, E |
| 65 | Masson | 32I/12, 13 | Phil Boudrias | Pointe fine nickel | Ni-Cu-Co-EGP | Pr, T, E |
| 66 | Escoumins | 22C/05 | J. Bernard | Escoumins - Bergeronnes | Cu, Au, Zn | Pr |
| 67 | Betsiamites | 22C/14 | C. Cyr | Mac Donald | Cu, Ni | Pr |

**TABLE 1E-1 – (cont'd)**

| N° | TOWNSHIP | NTS | COMPANY/PROSPECTOR | PROJECT | SUBSTANCE | WORK(1) |
|---|---|---|---|---|---|---|
| 68 | Le Baillif | 22F/05 | J.-Y. Fournier, S. Savard | Sault-aux-Cochons | Cu, Zn, Au | Pr |
| 69 | — | 22F/13 | AFCAN | Dissimieu | Fe, Ti, apatite | ET, Ev |
| 70 | — | 22F/16 | M. Bourque | Louis 99 | Cu, Ni | Pr |
| 71 | Morency | 22F/08 | G. Collin | Blanc | Cu, Ni | Pr |
| 72 | — | 22F/12 | B. Blais | Lac Betchie | Cu, Ni | Pr |
| 73 | — | 22F/12 | R.-O. Goulet | Lac en Dentelle | Cu, Ni | Pr |
| 74 | — | 22F/10 | Exploration Esbec | B15 | Cu, Ni, Co | Pr |
| 75 | — | 22F/16 | Exploration Esbec | B-40 | Cu, Ni, Co | Pr, G, T, S(1:20) |
| 76 | — | 22F/15 | Falconbridge Ltée, Exploration Esbec | B-50 | Cu, Ni, Co | G, T |
| 77 | — | 22K/06 | G. Couturier, Y. couturier | Hermas | Cu, Ni | Pr |
| 78 | — | 22O/05 | B. Poirier, M. Dionne | Grand Mesnil 99 | Cu, Ni, Zn, Au | Pr |
| 79 | — | 22O/03 | C. Ouellet, R. Ouellet, FREM | Papillon | Cu, Ni | Pr |
| 80 | Cormier | 22O/11 | André Gagnon | Montagne Blanche | Cu, Ni | Pr |
| 81 | Villeray | 22O/11 | Falconbridge Ltée | Haut-Plateau Est | Ni, Cu, Co, EGP | Pr, G, Mag.EM |
| 82 | — | 22O/12 | FREM, C. Ouellet, R. Ouellet | Lucie | Cu, Ni, Co, EGP | Pr, G, E, T |
| 83 | | 22N/08 | Éric Ducharme, FREM | Manicouagan | Cu, Ni | Pr |
| 84 | — | 22N/09 | Jean Fortin | 352 - 2 | Cu, Ni, Co, EGP | Pr, EM, S |
| 85 | Hervieux | 22N/15 | SOQUEM INC | Rivière Themines | Cu, Ni, Au, Pt, Pd | Pr, G |
| 86 | Strat | 22N/14 | J. Fortin, D. Fortin | La Fouille 1 | Au, Cu, Ni, Zn, Ag | Pr |
| 87 | Clément, Giasson, Pétel | 22N/16, 23C/01 | R. Tardif | Shabogamo | Cu, Ni | Pr |
| 88 | Courchesne, Guillimin | 23B/07 | C. Poulin, D. Rivière | Nivia | Cu, Ni, Co, EGP | Pr |
| **89** | **Normanville** | **23B/14** | **Compagnie minière Québec Cartier** | **Lac Bloom** | **Fe** | **G, Mag, S, ET, EF, TM** |
| 90 | Cannon, De Monts, Royer | 22G/06, 22G/11 | M. Morissette | Pointe-à-Poulin | Cu, Zn, Ni, Au | Pr |
| 91 | Cannon | 22G/11 | G. Bourgeois, F. Bourque | Rimouski | Cu, Zn, Au | Pr |
| 92 | — | 22G14 | C. Ouellet, R. Ouellet | CORO | Ni, Cu, Co | Pr, E, T, S(4:150) |
| 93 | — | 22G14 | Mines d'Or Virginia, FREM, Exploration Esbec | B-20 | Ni, Cu, Co | Pr, G, E, T |
| 94 | — | 22J/14 | C. Pelletier | Lac Culotte | Cu, Zn, Ni, Au | Pr |
| 95 | Leneuf | 22J/02 | C. Gauthier, FREM | Labrie | Cu, Ni | Pr, G, T, Gp |
| **96** | **Arnaud, Letellier** | **22J/02-07-08** | **SOQUEM INC, Norsk Hydro** | **Sept-Îles** | **Fe, Ti, apatite** | **EF, TM** |
| 97 | Moisie | 22I/05 | Ressources Fancamp | Mechant | Cu, Ni, Co | Pr, G, T, E |
| 98 | Charpeney, Coopman | 22I/07 | A. Simard | Sault-Plat 99 | Cu, Ni | Pr |
| 99 | — | 22I/11 | SOQUEM INC | Lac Brezel | Zn, Cu, Au | Pr, G, Gpa(EM) |
| 100 | | 22I/10, 22I/11 | M. Ouellet, FREM | Brezel-Est | Cu, Ni, Zn | Pr |
| 101 | — | 22I/14, 22P/03 | SOQUEM INC | Kwyjibo | Cu, terres rares | Gp, ET, Gc(ro) |
| 102 | — | 22I/14 | B. Dallaire, M. Castilloux, A. Gauthier, FREM | All-Burt-Mitch | Cu, Ni | Pr, |
| 103 | — | 22I/14 | R. Mimeault, J.-N. Cody, FREM | Manitou Nord-Est | Cu, Ni | Pr |
| 104 | — | 22P/01 | A. Chênevert | Solid-Rock | Cu, Ni | Pr |
| 105 | | 22P/02 | M. Castilloux, S. Petitpas | Black | Cu, Ni | Pr |
| 106 | — | 22P/02 | D. Guay, R. Lanthier | Serpent Jaune 99 | Cu, Ni | Pr |

**TABLE 1E-1 – (cont'd)**

| N° | TOWNSHIP | NTS | COMPANY/PROSPECTOR | PROJECT | SUBSTANCE | WORK[1] |
|---|---|---|---|---|---|---|
| 107 | — | 22P/02 | R. Lanthier | Magpie-Ouest | Cu, Ni | Pr |
| 108 | Parker, Puyjalon | 12L/11 | QIT Fer et Titane | Grader sud | Fe, Ti | G, Mag, Gp, Gc |
| 109 | Desherbiers | 12L/07 | G. Gallant, FREM | Lucy | Cu, Au | Pr, E |
| 110 | Johan-Beetz | 12L/07 | SOQUEM INC | Johan Beetz | Cu, Au | G, PP, T |
| 111 | — | 12L/15, 12L/16, 12M/01, 12M/02 | SOQUEM INC | Davy | Cu, Au | Pr, G |
| 112 | — | 12L/15 | G. Tanguay, J. Tanguay | Davy | Cu, Au | Pr |
| 113 | — | 12L/15 | M. Vaillancourt | EM-5 | Cu, Au | Pr |
| 114 | — | 12L/16 | H. Blake | Ludger-Blake | Cu, Ni | Pr |
| 115 | — | 12K/14 | R. Guillemette, P. Desjardins | Durocher | Cu, Au | Pr |
| 116 | Marsal | 12P/05 | G. Venne, M. Tennier | Rand | Cu, Ni, Au | Pr, Gp |
| 117 | — | 22I/14 | D. Lemenan | Tortue Nord-Est | Cu, Ni | Pr |

1. **EXPLORATION WORK LEGEND**

DPEM Electromagnetic survey
E Sampling
EF Feasibility or market study
EM Electromagnetic survey
ET Technical evaluation study
Ev Bulk sampling
G Geological survey
Gc Undefined geochemical survey
Gc(h) Humus geochemical survey
Gc(l) Lake bottom geochemical survey
Gc(ro) Rock geochemical survey
Gc(ru) Stream geochemical survey
Gc(s) Soil geochemical survey
Gc(t) Till geochemical survey
Gp Undefined geophysical survey
GpA Airborne geophysical survey
Mag Magnetic survey
PEM Pulse electromagnetic survey
PP Induced polarization survey
Pr Prospecting
S(nb:m) Diamond drilling (number: total metre)
Sci Reverse circulation drilling
T Trenching and stripping
TBF VLF electromagnetic survey
TM Metallurgical testing
**bold** Advanced-stage project
☐ MRN subsidized project

# 1F
# St. Lawrence platform and Appalachia

Serge Lachance

South-west Region (Montréal-Chaudière-Appalachia) ..... 40
Central Region (Lower St. Lawrence) ..... 40
North-east Region (Gaspé-Magdalen-Islands) ..... 40
Outlook ..... 40

Mining exploration investments were $5.5 M, including financial assistance of $835,000 from the MRNQ as part of its Mining exploration assistance program and $815,000 from the MRNQ's Financial assistance program for technical-economical studies. Some 98 projects were conducted and 5,056 m of drilling were completed. For a complete list of the 98 projects, please refer to Table 1F-1.

## South-west Region (Montréal-Chaudière-Appalachia)

Near Montréal, **Niocan** (22) continued development of its niobium project in the Oka Hill carbonatite Complex. The project consists of bringing to production an underground mine and of building a concentrate treatment plant to convert pyrochlore to ferroniobium on site. Apatite recovery is also included in the project. The identified mineral resources are of 14.37 Mt at 0.66 % $Nb_2O_5$ for the main S-60 zone, and of 5.95 Mt at 0.56 % $Nb_2O_5$ for the HWM-2 zone. The ore reserves (mineable with a cut-off grade of 0.50 % $Nb_2O_5$) for the two combined zones are estimated at 13.3 Mt at a grade of 0.6 3 % $Nb_2O_5$.

In the Thetford Mines area, **Ressources Allican** (10) has completed a technical and financial feasibility study, based on 16 drill holes totalling 1,513m. The project includes a low carbon ferrochrome smelter with an annual capacity of 20,000 metric tonnes. The smelter would be fed by imported concentrates and by subsequent exploitation of the Hall (open pit) and Reed-Bélanger (underground) chrome deposits in the Thetford Mines ophiolitic Complex. The mineral resources outlined so far are 1,018,000 t at 4.6 % $Cr_2O_3$ with an average grade of 0.22 g/t platinum for the Hall deposit and of 5.6 Mt at 6.78 % $Cr_2O_3$ for the Reed-Bélanger deposit.

On **R. Beaudoin** and **J. Ouellette** (28) Chute du Bras property, located in the Rivière des Plantes ophiolite melange, assay results of quartz and pyrite veins returned 21.9 g/t Au and numerous values between 1 and 9 g/t Au. These results confirm the gold potential of the Baie Verte-Brompton Line ophiolite complexes.

In Ware Township, **Explorateurs-Innovateurs** and its partners (39) continued evaluating the zinc potential of the Syndicat François Dussault project, in the volcano-sedimentary sequence of the St. Daniel Mélange. A recent drill hole intersected a 10m section grading 1 % Zn. The best intersections returned by the 1998 drill program were 1 m at 4.5 % Zn and 1.5 m at 6 % Zn.

## Central Region (Lower St. Lawrence)

**Appalaches Resources** and **SOQUEM INC** (47) continued the evaluation of the St. Guy copper property (Squatec project). The property comprises a series of red bed copper showings with results of 0.1 to 8.8 % Cu locally in red (hematitized) and green sandstones and conglomerates of the Robitaille Formation.

## North-east Region (Gaspé-Magdalen-Islands)

Sandstones and mudstones of the Garin Formation of the Honorat Group underlie the Robideaux (92) property, where **Appalaches Resources** initially discovered mineralized quartz blocks with visible gold. Following this, trenching programs located no less than 30 gold-bearing zones in a network of quartz veins and faults. On one of these structures, two drill holes intersected mineralized zones containing visible gold in quartz veins. Drill hole 99-02 intersected 6 m grading 3.1 g/t Au and 4.1 g/t Ag , including a 1 m section grading 12.5 g/t Au and 7.5 g/t Ag. Drill hole 99-01 intersected a 4.17 m mineralized zone in which a 1.26 m section returned 1.1 g/t Au and 61.0 g/t Ag.

On the **Mid-Patapédia** (88) property, optioned from **Noranda inc**, **Appalaches Resources** worked on a hydro-thermal alteration zone hosting the Mid-Patapédia deposit. The mineral resources identified on the deposit have in the past been estimated at 4 Mt at 0.25 % Cu and 5 g/t Ag. Grab samples (1999 work) returned up to 49 g/t Au, 325 g/t Ag, 5 % Sb, 2 % Zn, 0.30 % Cu and more than 1 % Pb. Hole 99-01 drilled in the north part of the mineralized zone intersected a 48.6 m section with values of 0.27 % Cu, 17.1 g/t Ag and 0.3 g/t Au and another 16.7 m section with grades of 0.48 % Cu, 12.7 g/t Ag and 0.2 g/t Au.

**SOQUEM INC**(87), in partnership **with Noranda inc**, continued exploration work on the Vallières property in Lesseps Township (3 drill holes totalling 1,384m). The company were searching for porphyry copper and skarn deposits in the carbonaceous rocks of the Chaleurs Group and of the Calcaires Supérieurs of the Gaspé Group.

## Outlook

The level of exploration activity in 2000 should equal the level in 1999. Development of the **Niocan** (ferroniobium) and **Ressources Allican** (ferrochrome) projects will continue. The likelihood of the renewal of the Mining Exploration Assistance Program, which terminates in March 2000, should maintain grass roots exploration.

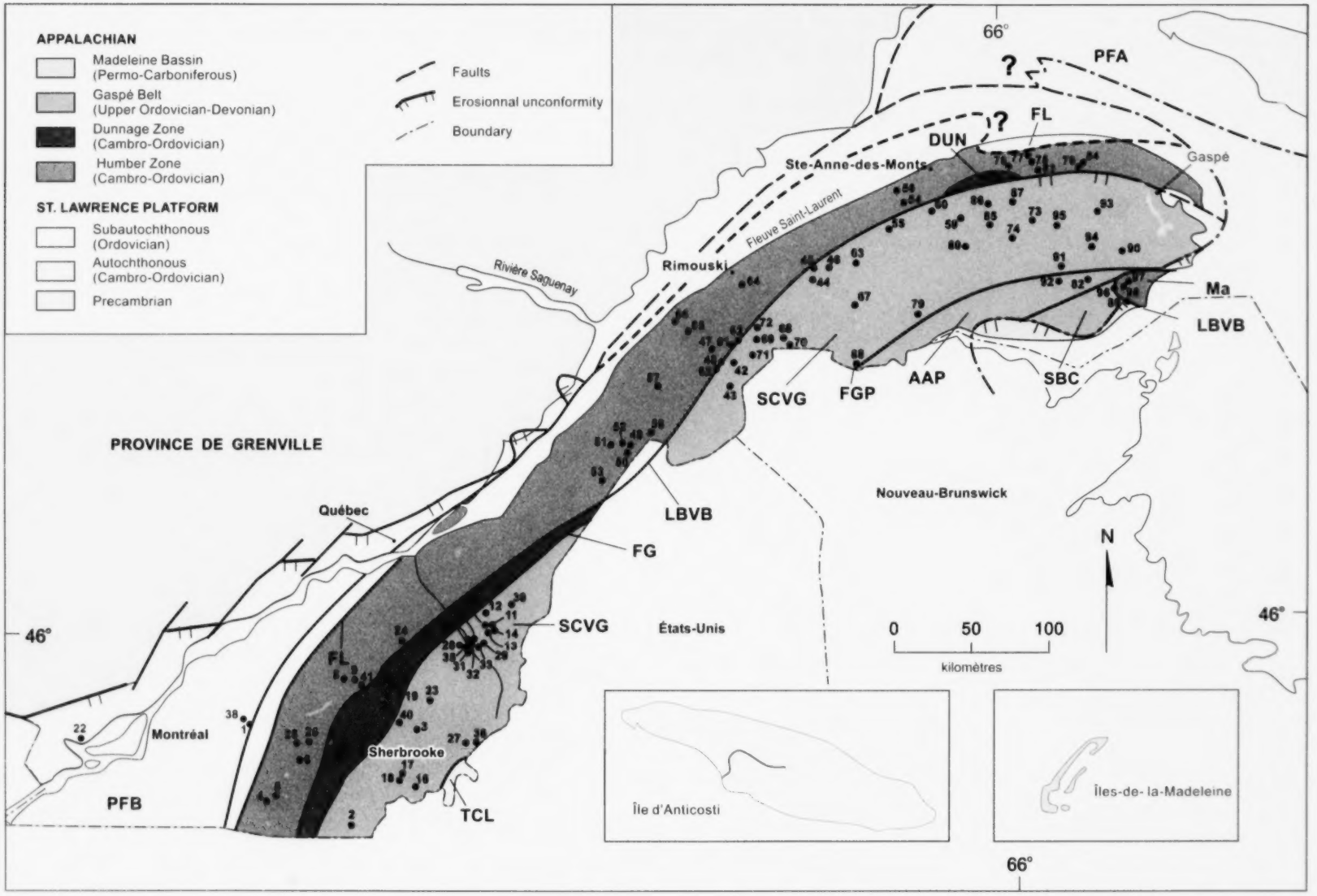



**FIGURE IF-1** – Location of exploration work in 1999, total of 98 projects (no 1 to 98).
Abbreviations: **AAP**: Aroostook-Percé anticlinorium; **DUN**: Dunnage zone; **FGP**: Grand Pabos fault; **FL**: Logan fault; **FG**: Guadeloupe fault; **LBVB**: Baie Verte-Brompton line; **Ma**: Maquereau-Mictaw window; **PFA**: Anticosti platform; **PFB**: St. Lawrence Lowlands platform; **SBC**: Baie des Chaleurs synclinorium; **SCVG**: Connecticut Valley-Gaspé synclinorium; **TCL**: Chain Lakes terrane.

**TABLE 1F-1 – Exploration work over the St. Lawrence and the Appalachia territory in 1999 (see figure 1F-1).**

| N° | TOWNSHIP (SEIGNIORY) | NTS | COMPANY/ INDIVIDUAL | PROJECT | SUBSTANCE | WORK[1] |
|---|---|---|---|---|---|---|
| **SOUTH-WEST REGION (MONTREAL - CHAUDIÈRE - APPALACHIA)** | | | | | | |
| 1 | Acton | 31H/09-10 | Phelps Dodge Canada | Acton | Pb, Zn | S(4:388) |
| 2 | Barford | 21E/04 | J. Ouellette | Saint-Herménégilde | Cu, Au, Bi, Ag | Pr, Gp, Gc(s) |
| 3 | Beauce et Estrie | 21E-L, 31H | SOQUEM INC | Beauce et Estrie | Cu, Pb, Zn, Au, Ag | Pr |
| 4 | Bolton | 31H/01 | A. Girard | Bolton-Est 1999 | Au, Cu, Pb, Zn | Pr, Gp, Gc(ro) |
| 5 | Bolton | 31H/01 | FEMECA | Bolton | Au, Cu, Zn | Gp |
| 6 | Brompton | 31H/08 | R. Beaudette | Petit Lac Brompton | Cu, Au | Pr, Gc(ro) |
| 7 | Broughton | 21L/03 | T. Fecteau | Broughton | Au, Ag | Pr, T |
| 8 | Chester | 21L/04 | Y. Landry | Sainte-Hélène | Cu, Au | Pr, Gc |
| 9 | Chester | 21 E/13, L/04 | R.S. Lécuyer | Viger Copper | Cu, Zn, Au, Ag | Gp |
| 10 | Coleraine | 21L/03 | Ressources Allican | **Allican Thetford Mines** | Cr, Pt | EF, ET, S(16:1 513), Gp |
| 11 | Cranbourne | 21L/07 | G. Duguay | Zinc - Beauceville | Zn, Cu, Au | Gp, Gc(ro) |
| 12 | Cranbourne | 21L/07 | C. Vachon et L. Fecteau | Cranbourne | Cu, Zn, Au | Gp, Gc(ro) |
| 13 | Cranbourne | 21L/07 | Y. Hébert | Lac Boule | Au | Pr, Gc(ro) |
| 14 | Cranbourne | 21L/07 | F. Loubert et W. Vachon | Lac Fillion | Au, Zn, Cu | Pr, Gp, Gc(ro, s) |
| 15 | Cranbourne | 21L/07 | P. Ratté et G. Poulin | Saint-Benjamin | Au, Cu, Zn | Pr, Gc(ro) |
| 16 | Ditton | 21E/06 | R. Beaudoin | Mining Brook | Au, Cu, Pb, Zn | Pr, Gp, Gc(ro) |
| 17 | Ditton | 21E/06 | C. Royer | Étoile d'Or | Au, Ag, Cu, Zn, Pb, Bi | T, Gc(ro) |
| 18 | Ditton | 21E/06 | C. Royer | Ditton-Ouest | Au, Ag, Cu, Zn, Pb, Bi | T, Gc(ro) |
| 19 | Garthby | 21E/14 | G. Binet et L. Fecteau | Colline Brousseau | Cr, Pt | T, Gc(ro) |
| 20 | Garthby | 21E/14 | G. Galarneau | Platine 36 | Pt, Pd | Pr, Gc(ro) |
| 21 | Garthby | 21E/14 | Y. Moreau et G. L'Heureux | Garthby | Au, Pt | Pr, Gc(ro) |
| 22 | (Lac-des deux-Montagnes) | 31G/09-08 | Niocan | **Niocan** | Nb | EF |
| 23 | Lambton | 21E/14 | J. Audet et S. Pomerleau | Lambton | Au, Ag, Zn | Pr, Gc(ro) |
| 24 | Leeds | 21L/03 | R.S. et L. Fecteau | Nugent | Cu, Au | Gp |
| 25 | Melbourne | 31H/09 | M.-H. Gravel | Denman | Ag, Pb | Gc(ro, h) |
| 26 | Melbourne | 31H/09 | B. Trudel | Francis 99 | Cu, Au, Cr, Ni | Pr |
| 27 | Risborough, Spalding et Ditchfield | 21E/15-10 | FEMECA | Victoria | Au, Ag, Pb, Zn, W | Pr, Gc(ro) |
| 28 | (Saint-François) | 21L/02 | R. Beaudoin et J. Ouellette | Chute du Bras | Au, Ag, Cu, Pt | Gp, Gc(ro, s), T |
| 29 | (Saint-François) | 21L/02 | P. Mrakic | Saint-Gustave 1999 | Au | T |
| 30 | (Saint-François) | 21L/02 | FEMECA | Magodor | Au, Zn | Gp, Gc(t, s, ml) |
| 31 | (Saint-François) | 21L/02 | J. Ouellette | Du Moulin 99 | Au | S(1:30), Gc(t, ro) |
| 32 | (Saint-François) | 21L/02 | R. Mainville | Loubier - Kilgour | Au, Zn | Gp, Gc(t, s, ro) |
| 33 | (Saint-François) | 21L/02 | R. Mainville | Saint-Simon | Au | Gc(s) |
| 34 | (Saint-François) | 21L/02 | R. Grondin | Fraser-1 | Au | Gc(ro), T |
| 35 | (Saint-François) | 21L/02 | P. Mrakic et R. Beaudoin | Des Meules | Au | Pr, Gc(ro) |
| 36 | Spalding | 21E/10 | N. Bilodeau et C. Vachon | Spalding | Cu, Au | Pr, Gp, Gc(ro) |
| 37 | Stoke | 21E/05-12 | Phelps Dodge Canada | Stoke | Cu, Zn | S(4:728), Gp |
| 38 | Upton et Acton | 31H/10 | D.J. Kouri | Kouri-Roy | Zn, Cu, Pb, Ag, Ni, Cd | S(1:110), Gp |
| 39 | Ware | 21L/08 | E. Gaucher (Ex-In), SOQUEM INC, Mines d'Or Virginia et investisseurs | Syndicat François Dussault | Zn, Cu | S(4:122), Gp |
| 40 | Weedon et Stratford | 21E/11 | Namex Explorations Inc. | Weedon | Cu, Zn | Pr, G |
| 41 | Wolfestown | 21E/13 | G. Galarneau | Nicolet | Cu, Ag, Au | Pr, G, Gc |

**TABLE 1F-1 – (cont'd)**

| N° | TOWNSHIP (SEIGNIORY) | NTS | COMPANY/ INDIVIDUAL | PROJECT | SUBSTANCE | WORK[1] |
|---|---|---|---|---|---|---|
| **CENTRAL REGION (LOWER ST. LAWRENCE)** | | | | | | |
| 42 | Asselin | 21N/15-16 | FEMBSL | Lac Raymond | Cu, Pb, Zn | Pr, T, Gc(ro) |
| 43 | Auclair et Asselin | 21N/15 | R. Bourgoin | Saint-Godard | Au, Cu, Pb | Pr, Gc(ro) |
| 44 | Awantjish | 22B/05 | F. Rodrigue | Lac Alfred | Pb, Zn | Pr, Gc(ro) |
| 45 | Awantjish et Massé | 22B/05 | FEMBSL | Awantjish | Au, Pt, Pd | Pr, Gc(ro) |
| 46 | Awantjish et Nemtayé | 22B/05 | R. Turcotte | Tayé | Cu, Pb, Zn, Ag | Pr, Gc(ro) |
| 47 | Bédard, Chénier, Biencourt, Robitaille et Madawaka-01 | 22C/02, 21N/15 | Ressources Appalaches et SOQUEM INC | Squatec | Cu | G, Gp, Gc(s) |
| 48 | Biencourt | 21N/15 | FEMBSL | Biencourt | Cu, Zn, Au, Ag | Pr, Gc(s) |
| 49 | Chabot | 21N/06 | FEMBSL, J. Guillot et R. Tourigny | Roland 99 | Au, Ag, Cu | G, Pr, Gc(s) |
| 50 | Chabot | 21N/06 | FEMBSL, R. Tourigny et J. Guillot | Saint-Athanase | Au | G, Pr, Gc(ro) |
| 51 | Chabot | 21N/05-06 | R. Tourigny et J. Guillot | Chabot 99 | Au, Ag, Cu | Pr, Gc(ro) |
| 52 | Chabot | 21N/06 | J. Guillot et R. Tourigny | Roland 99 | Au, Ag, Cu | S(3:106), G, Pr, Gc(s) |
| 53 | Chapais | 21N/05 | J. Lévesque | Lac Chaudière | Cu, Pb, Zn | Pr, Gc(ro) |
| 54 | Cherbourg et Dalibaire | 22B/14-15 | FEMBSL | Cherbourg | Pb, Zn | Pr, Gc(ro) |
| 55 | Cuoq | 22B/11 | FEMBSL | Lac Duvivier | Cu, Zn, Co, Ni | Pr, Gc(ro) |
| 56 | Dalibaire | 22B/14 | A. Leblanc et L. Leclerc | Dalibaire | Cu, Pb, Zn | Pr, Gc(s) |
| 57 | Demers | 21N/14 | FEMBSL | Saint-Hubert | Au | Pr, Gc(ru) |
| 58 | Estcourt | 21N/11 | N. Fournier et B. Pineau | La Roche Dure | Au, Cu, Pb, Zn | S(3:168) |
| 59 | Faribault, Richard et Dunière | 22B/09-10-15-16 | FEMBSL | Richard | Cu, Ni, Co | Pr, Gc(ro) |
| 60 | Joffre | 22B/15 | FEMBSL | Mont Coleman | Cu, Co | Pr, Gc(ro) |
| 61 | La Roche | 22C/02 | FEMBSL | Esprit-Saint | Cu, Au | S(2:61) |
| 62 | La Roche et Biencourt | 22C/01-02, 21N/15 | FEMBSL | La roche - Biencourt | Au | Pr, Gc(ro) |
| 63 | Lepage et (Lac Matapédia) | 22B/11 | FEMBSL | Saint-Tharcisius | Cu, Ni, Co | Pr, Gc(ro) |
| 64 | Macpès | 22C/07-08 | J. Thibeault | Saint-Léon | Cu, Pb, Zn | Pr, Gc(ro) |
| 65 | (Nicolas-Rioux) | 22C/02 | FEMBSL | Lac des Iles | Au, Cu | Pr, Gc(ro) |
| 66 | (Nicolas-Rioux) | 22C/02 | FEMBSL | Saint-Mathieu | Au | Pr, Gc(ro) |
| 67 | Pineault, Jetté, Humqui, Rimouski et (Lac Mitis) | 22B/03-04-05-06 | FEMBSL | Sainte-Florence | Au | Pr, Gc(ro) |
| 68 | Réserve Rimouski | 22C/01 | FEMBSL | Kedgwick | Au | Pr, Gc(ro) |
| 69 | Réserve Rimouski | 22C/01 | FEMBSL | Réserve Rimouski | Au | Pr, Gc(ro) |
| 70 | Réserve Rimouski | 22B/04 | J.Y. Lévesque | Polar | Au, Cu, Pb, Zn | Pr, Gc(ro) |
| 71 | Réserve Rimouski | 22C/01, 21N/16 | A. Turcotte | 99-01 | Cu, Pb, Zn | Pr, Gc(ro) |
| 72 | Varin et Flynn | 22C/01 | FEMBSL | Longue Vue | Cu, Zn, Pb | Pr, Gc(ro) |
| **NORTH-EAST REGION (GASPÉ - MAGDELEN-ISLANDS)** | | | | | | |
| 73 | Appalaches | 21C-E-L-N; 22A-B-C-G-H | SOQUEM INC | Avant-projet Appalaches | Cu, Pb, Zn, Au, Ag | Eval., génération de projets |
| 74 | Baldwin | 22B/09 | G. Therrien et O. Robinson | G.O. | Cu, Pb, Zn, Ag | Pr, Gc(ro) |
| 75 | Boisbuisson | 22H/04 | L. Lamarche | Duchesnay, Bloc 2 | Pb, Zn, Au, Ag | Pr, Gc(ro) |

**TABLE 1F-1 – (cont'd)**

| N° | TOWNSHIP (SEIGNIORY) | NTS | COMPANY/ INDIVIDUAL | PROJECT | SUBSTANCE | WORK[1] |
|---|---|---|---|---|---|---|
| 76 | Denoue | 22H/03 | G. Côté | Shickshock Est | Au, Ag, Cu | Pr, G, Gc(ro) |
| 77 | Duchesnay | 22H/04 | J.R. Lavallée | Duchesnay, Bloc 1 | Pb, Zn, Au, Ag | Pr, G, Gp, Gc(s, ro), T |
| 78 | Duchesnay et Boisbuisson | 22H/04 | A. et M.-L. Leclerc | Leclerc | Cu, Pb, Au, Ag | Pr, Gc(ro) |
| 79 | Fauvel | 22B/02 | B. Boulanger | Fauvel 1999 | Au | Pr, Gc(ro) |
| 80 | Gaspésie | 22A-B-G-H | SOQUEM INC | Gaspésie | Cu, Pb, Zn, Au, Ag | Pr, Gc, génération de projets |
| 81 | Gaspésie | 22A-B-G-H | FRAPMGIM | Cibles-FRAPMGIM | Cu, Pb, Zn, Au, Ag, Co | Pr, G, Gc(s, ru, ro) |
| 82 | Honorat | 22A/06 | Ressources Appalaches | Garin | Cu | G, Pr, T |
| 83 | La Rivière | 22H/04 | M. Chouinard | Lac Mont-Louis Sud | Au, Ag, Cu | Pr, Gc(ro) |
| 84 | Lefrançois et Champoux | 22H/03 | G. Côté | 3 Cantons | Au, Ag, Cu | Pr, Gc(ro) |
| 85 | Lemieux | 22B/16 | G. Therrien et O. Robinson | Brandy | Cu, Pb, Zn, Au, Ag | Pr, G, Gp, Gc(ro), T |
| 86 | Lemieux | 22B/16 | G. et Y. Gasse | Réserve Albert | Cu, Pb, Zn | Pr, Gc(s, ro) |
| 87 | Lesseps | 22A/13 | SOQUEM INC et Mines et Exploration Noranda | Vallières - 319 | Cu | G, Gp, S(3:1384) |
| 88 | Patapédia | 21O/14 | Ressources Appalaches | Mid-Patapédia | Au | S(1:162), Gc(ro), T |
| 89 | Port-Daniel | 22A/06 | M. Daigneault et C. Gallon | Port-Daniel - Gascon 99 | Cu, Pb, Zn | Pr, Gc(ro) |
| 90 | Randin | 22A/11 | P. Grenier | Hélico Est | Cu, Ag, Zn | Pr, Gc(ro) |
| 91 | Reboul | 22A/14 | F. Bernard et L. Roberge | Chevreuil | Cu, Pb, Au, Ag | Pr, Gc(ro) |
| 92 | Robidoux | 22A/05 | Ressources Appalaches | Robidoux | Au | G, Pr, T, S(3:192), Gp, Gc(s) |
| 93 | Sirois | 22A/14 | J.B. Beaudin et L. Leblanc | Camp 50 | Cu, Pb, Zn, Au, Ag | Pr, Gc(ro) |
| 94 | Vondenvelden | 22A/11 | J.B. Beaudin et L. Leblanc | Triangle d'argent | Cu, Ag | Pr, G, Gp, Gc(ro), T |
| 95 | Walbank, Deville et Gastonguay | 22A/12 | R. Béland et M. Chouinard | Les Roches Ignées | Au, Ag, Cu | Pr, Gc(ro) |
| 96 | Weir | 22A/06 | M. Fulham | Weir | Cr, Cu, Ni, Au, As, Pb, Mn, Cs, Mo | Pr, Gc(ro) |
| 97 | Weir, Newport et Randin | 22A/07 | Ressources Appalaches | Port-Daniel | Zn, Cu | Pr, T |
| 98 | Weir, Randin, Newport et Port-Daniel | 22A/07 | SOQUEM INC | SBC des Pins | Cu | G, Gp, Gc(so), T, S(3:92) |

1. **EXPLORATION WORK LEGEND**

DPEM Down-hole Pulse electromagnetic survey
E Sampling
Fe Feasibility and/or market study
EM Electromagnetic survey
ET Technical evaluation study
Ex Bulk sampling
G Geological survey
Gc Undefined geochemical survey
Gc(h) Humus geochemical survey
Gc(l) Lake bottom geochemical survey
Gc(ml) Heavy mineral geochemical survey
Gc(ro) Rock geochemical survey
Gc(ru) Stream geochemical survey
Gc(s) Soil geochemical survey
Gc(t) Till geochemical survey
Gp Undefined geophysical survey
GpA Airborne geophysical survey
Grav. Gravimetric survey
Mag Magnetic survey
PEM Pulse electromagnetic survey
PP Induced polarization survey
Pr Prospecting
S(nb:m) Diamond drilling (number: total metres)
Sc Reverse circulation drilling
T Trenching and stripping
TBF VLF electromagnetic survey
TM Metallurgical testing
* Mine site exploration work
**bold** Advanced-stage project
☐ MRN subsidized project

2

# Construction materials, industrial minerals and peat moss

Yves Bellemare
Pierre Buteau
Henri-Louis Jacob

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Industrial minerals ..... 46
Mining ..... 46
Exploration ..... 46
Peat moss ..... 47

## Building material

For 1999, a total of 50 quarries of dimensional stone, including tile slate, were in production. The Rivière-à-Pierre area (NTS topographical map sheets 31I/16 and 31P/01) remains the most important mining camp for dimensional stone production, with nine quarries. Intense activity is also present near the villages of St. Nazaire (4 quarries) and of St. Alexis-des-Monts (4 quarries).

During the year, three new quarries were brought into production. In Pinsonnault Township, 90 km north of the village of St. Ludger-de-Milot, **Granite Péribonka** has begun mining a coarse grained monzodiorite or monzogabbro (31; figure II, appendix). Elsewhere, **Investrock** began exploiting a quarry, located west of St. Nazaire (38; figure II, appendix), that contains a blackish gray porphyroblastic anorthosite with shimmering blue, green, yellow or red fragments. Finally, **Excavations Montauban** has advanced its Vert Boréal property, located southwest of Rivière-à-Pierre. The property was acquired by Polycor Group (27; figure II, appendix).

As of December 1, 1999, 900 titles were active (PRS and BNEP) for building material exploration in Quebec. A third of these titles were registered in 1999. More than 250 PRS are located in the St. Marc-du-Lac-Long (NTS 21N/06, 21N/07 and 21N/10) area. **Glendyne** Company is mining a slate quarry there. Almost all of the exploration projects are located in the Grenville Province. The projects are mainly found in the Saguenay-Lac St. Jean, Rivière-à-Pierre and Notre-Dame-de-la-Merci areas. The Saguenay-Lac St. Jean area is the most preferred area for building material exploration. More than 300 titles are active in NTS 22D, 22E, 32A and 32H.

Fifteen exploration titles (PRS) were renewed and 44 projects that have seen exploration work in 1999 have been brought to our attention. Within these, **Granicor** conducted important exploration work on two properties. In Taché township (site 24), the company conducted stripping work following prospecting and diamond saw sampling of outcrops. Following encouraging results, an application for a mining lease (BEX 332) was filed. A biotite leucogabbronorite of the Black Cambrian variety was discovered. However in this case, the biotite is blackish instead of brownish. Production from this area is expected to begin in the year 2000. In Dalmas Township, (site 17) a property straddling NTS sheets 22D/13 and 32A/16 has undergone stripping and sampling in 1999. The rock is an augen gray-pink farsundite and the proposed commercial name is Tiger Wood. A quarry is planned to open in 2000.

**Michel Bouchard** has sampled blocks on the Lac Long (site 18) property, in Petit Township. A Vert Cascade variety dark green granite (farsundite?) was identified on the property. Mining should begin in 2000. **Pauline Godin-Cloutier** and her family have been working in St. Hilaire Township (site 27). Following their work, Granite Aurélien Tremblay company stripped the outcrops and acquired the mining rights of the PGC property. Mining is also planned for 2000. The **Quebec ministry of Natural resources** is carrying out geological mapping programs each year. One of these projects, under the direction of Suzie Nantel, has lead to the identification of a significant dimensional stone potential for the area covered by NTS sheet 31J/15, near Volvic and du Débordement lakes (site 5). The brownish red and greenish gray farsundite of the Volvic pluton has a massive appearance on several outcrops. The geological context is favorable and should attract the granite industry to this area.

## Industrial minerals

### MINING

Twenty-six mines or quarries were in production for industrial minerals in 1999. Industrial minerals produced include asbestos (3 mines); limestone and high purity dolomite (6 quarries); silica (19 quarries); titanium minerals, flake graphite, crushed mica, specularite (hematite), talc, block steatite and wollastonite (1 mine or quarry each). Summary information on each of these operations is found in Table III and on figure II in appendix.

1999 preliminary data indicates that the total value of industrial mineral expeditions reached $787 M, compared to $807.5 M in 1998. Asbestos, titanium bioxide and salt have seen slight decreases in their expedition value, while other minerals saw slight increases.

**Magnola Metallurgy** has continued construction of the Magnola plant, which will produce magnesium from serpentine rejects of the JM Asbestos mine at Asbestos. The plant will require a $730 M investment and will have a 60,000 tonnes per year capacity. Commercial production should begin in June 2001.

Finally, **Orleans Resources** did not operate its wollastonite treatment plant in 1999. The company completed its financement in january 2000 and restarted its production january 21st, 2000.

### EXPLORATION

A total of 29 exploration projects, for about 15 different substances (rocks and/or minerals), have been reported for 1999 (figure 2.2 and Table 2.3). More than half of these projects underwent mostly simple prospecting and sampling, done for the most part within prospecting assistance programs or with the assistance of regional mining funds.

The more advanced exploration projects include the work of **Ceramco**, which was delineating new mineable high purity (dental quality) potash feldspar zones in the old Perkins mine area, to the north of Buckingham (project n° 57). **Graybec Calc** conducted an important drilling program to evaluate a high-purity reef limestone deposit in the Canadiens Range, a few kilometers to the north of their St. Adolphe-de-Dudswell quarry (project n° 66).

High purity silica remained a much sought-after commodity in 1999 with 6 reported projects. **Baskatong Quartz** company carried out the most significant work, which consisted in re-evaluating a large pegmatitic quartz vein outcropping in the Lac Noir area, north of Lac St. Jean (project n° 50).

Most of the advanced projects on the 1998 list were continued in 1999 with market studies, metallurgical testing or technical studies to establish the feasibility of the projects. However, no major development was reported in 1999.

As for new projects this year, **Ressources Allican** has revived the former Coleraine Resources ferro-chrome plant project in the Thetford Mines area. The company has conducted geological work and drilling to re-evaluate the reserves and grade of the Hall chromite deposit in Coleraine Township. The company also holds rights to the Reed-Bélanger deposit in Coleraine Township and an option on the Colline Brousseau deposit in Garthby Township.

**SOQUEM INC** joined forces with **Canspar Resources** to evaluate the mica (muscovite) potential of the Molybdenite Corporation tailings in Lacorne Township (project n° 46). The tailings reserves are evaluated at 3.8 M tonnes and may contain about 10 % muscovite.

## PEAT MOSS

In 1999, 23 peat moss producers were exploiting some 40 peat bogs in Quebec, mainly in the Lower St. Lawrence, Côte-Nord and Saguenay-Lac St. Jean areas. Expeditions for 1998 were 9,066,509 bags of 170 $dm^3$ for a total value or $41.1 M. From 1999 data, a 12 % increase in expeditions (10,420,000 bags) for a total value reaching $48 M is foreseeable.

The 1999 production period was similar to 1998 with an early start at the beginning of May. The months of June and July saw frequent precipitation. The dryer conditions in August brought the inventory back to normal. Some producers have benefited from favorable weather conditions up to the end of September, although daily harvesting periods are normally short at that time of the year.

**Premier Tech**, a subsidiary of **Premier Enterprises CDN**, has started construction of a bagging equipment factory in Rivière-du-Loup during the fall.

This fall, **Tourbières Lambert** put on the market a brand new culture substratum developed from the properties and advantages of humic acids.

Near Drummondville, **Fafard et Frères** of St. Guillaume, completed the construction of a new composting plant and another plant for culture substratum production.

**Premier Horticulture**, Sogevex division of Pointe Lebel, has opened up vast areas over land where it holds exploitation rights. The Sept-Îles division has also opened up important surfaces over the Moisie River deposit.

**Tourbières Blocs Dorés** began production of its deposit located between Sept-Îles and Port Cartier.

In the Eastern Townships, **Les Marbres Waterloo** began production on a commercial basis of peat-based organic-mineral fertilizers for RBF Technologies (Recyclage Bio-Forêts).

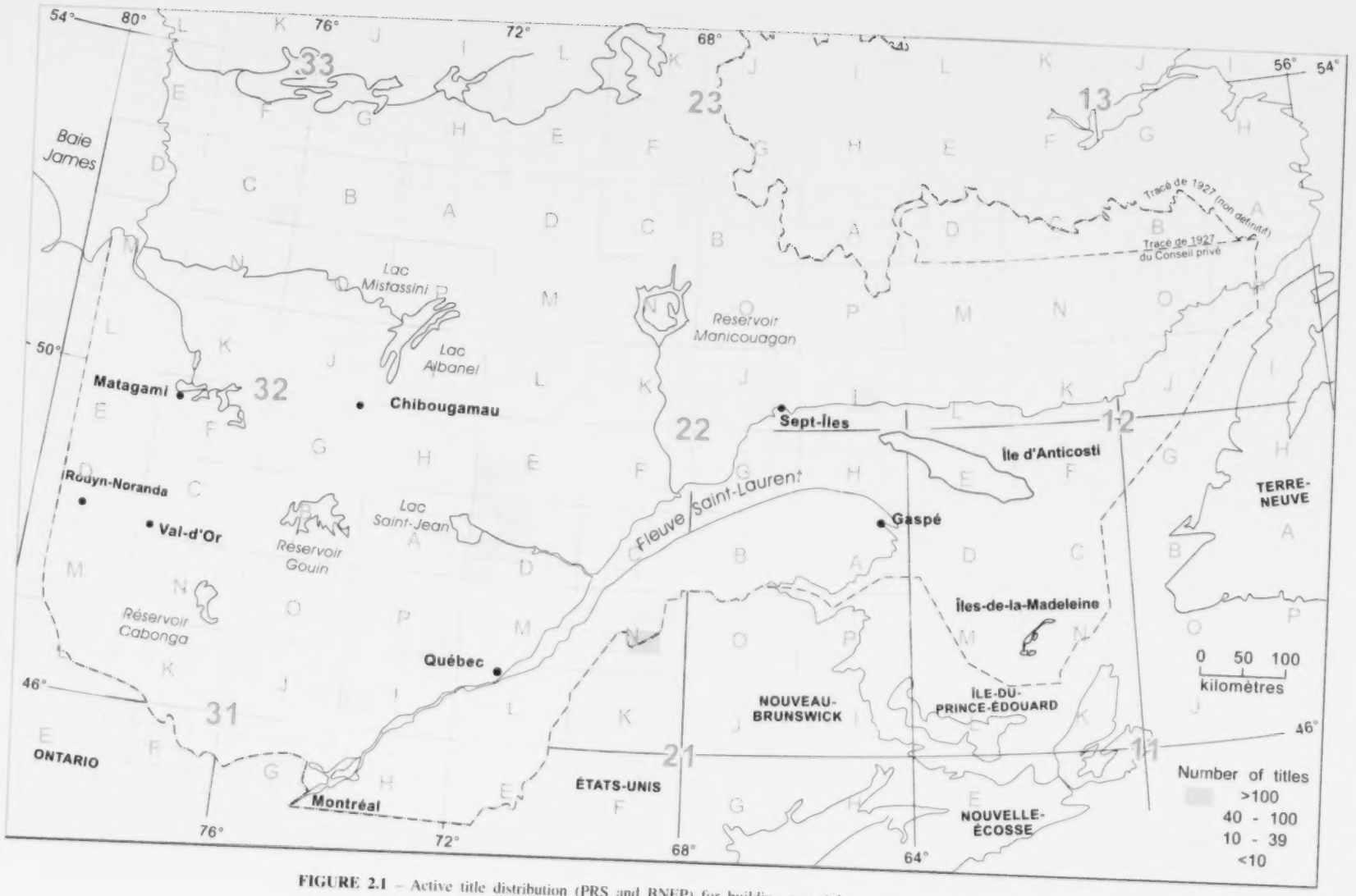


**FIGURE 2.1** – Active title distribution (PRS and BNEP) for building material, as of December 1, 1999.

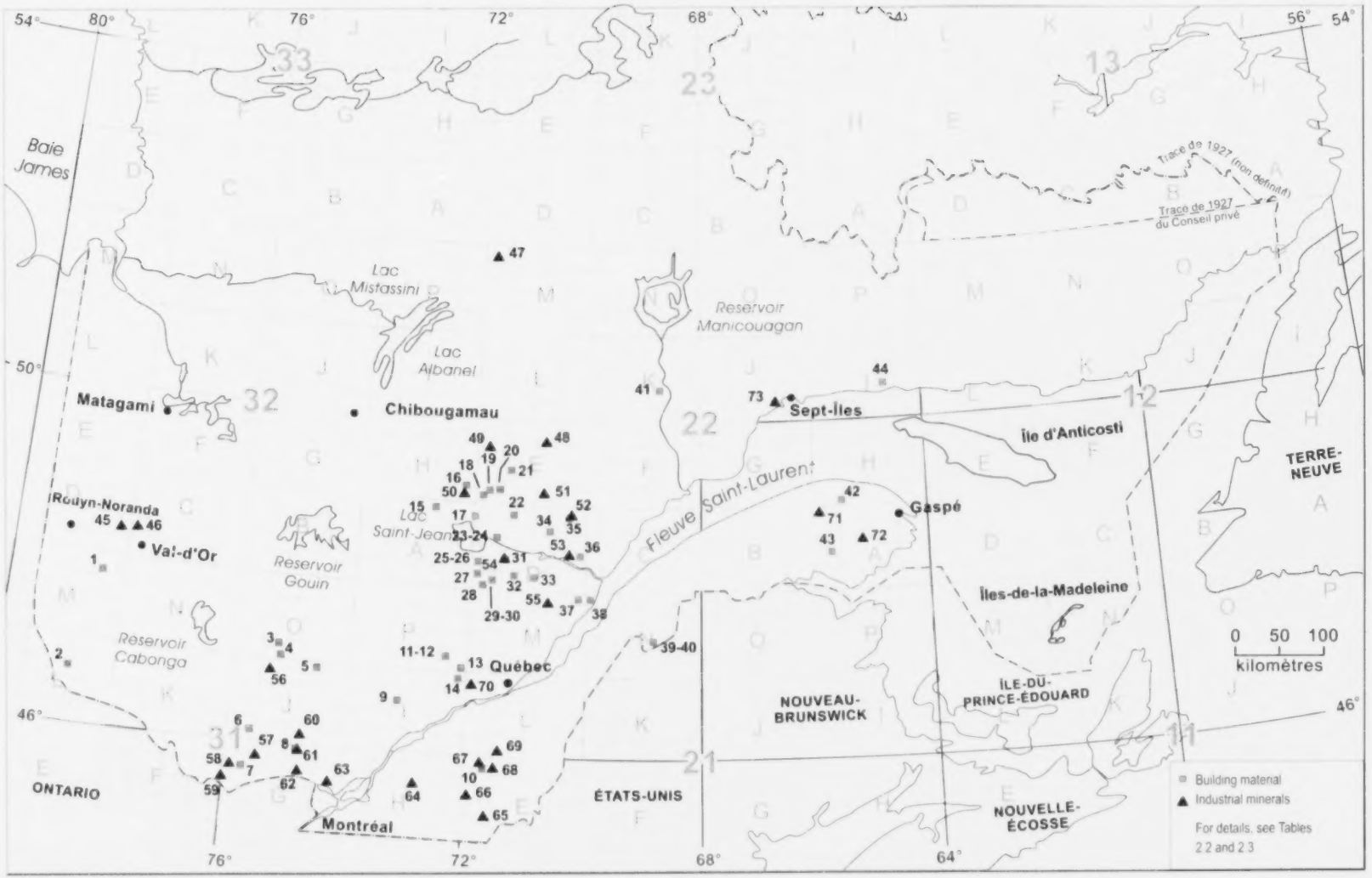


**FIGURE 2.2** – Location of exploration projects in Québec in 1999. Building material and industrial minerals.

**TABLE 2.1 – List of renewed titles in 1999 for building material.**

| PROJECT | NTS | PRS | HOLDER | GM NUMBER | * | DETAILS |
|---|---|---|---|---|---|---|
| 1 | 21N07 | 3225-3229 | Glendyne | 56504 | 39 | Ardoise, levé géologique |
| 2 | 21N07 | 2485 | Victorien Lemay | 56654 | 40 | Ardoise, sondages |
| 3 | 22C02, 03 | 2440, 3193 | 3545016 Canada | 56324 | 36 | Grès, échantillonnage |
| 4 | 22D12 | 3305 | 2329 1677 Québec | 56675 | N. C. | Granit, travaux de surface |
| 5 | 22D12 | 3192 | 9004-1344 Québec | | N. C. | Projet Noir Cambrien |
| 6 | 22D14 | 3281-3282, 3287 | Antoine Blackburn | 57117<br>57118 | N. C. | Granit brun, travaux de surface |
| 7 | 22E04 | 3323-3325 | 2329 1677 Québec | 56683 | 20 | Granit, travaux de surface |
| 8 | 22E06 | 2375,2378 | Granit Lefebvre | 56226<br>56313 | N. C. | Granit, travaux de surface, géologie lithogéochimie, étude géotechnique |
| 9 | 22I07 | 3373-3374 | Carrières Norgranit | 56604 | 44 | Granit, décapage, levé géologique |
| 10 | 31G14 | 2477-2480, 3239 | Granite du Rat Musqué | 56203<br>56497 | N. C. | Diabase, décapage |
| 11 | 31I16 | 3294 | 2329 1677 Québec | 56686 | 12 | Granit, projet Ver FB, travaux de surface |
| 12 | 31I16 | 3299-3300 | 2329 1677 Québec | 56684 | 12 | Granit, projet Marnier FB, travaux de surface |
| 13 | 31I16 | 3155-3157 | Excavations Montauban | 56561 | 11 | Granit, projet Vert Boréal, travaux de surface |
| 14 | 31P16 | 3295-3296 | 2329 1677 Québec | 56685 | N. C. | Granit, travaux de surface |
| 15 | 32D03 | 3448 | 143454 Canada | 56672 | N. C. | Projet Granit noir, levé géologique, travaux de surface |

* Refer to project number in DV 99-01, p. 71-72. (N. C. : unquote)

**TABLE 2.2 – Exploration work in Québec in 1999 for building material (see figure 2.2.).**

| SITE | NTS | TITLE* | HOLDER | USE** | TYPE OF WORK*** | DETAILS |
|---|---|---|---|---|---|---|
| 1 | 31M09 | 4065-4069 | Normand Gibson | PD | E | Résultat encourageant |
| 2 | 31L10 | 4214, BNEP 454 | Gérard Houle | GD | Gc | Quartzite à muscovite verte, ancien PRS 2323 |
| 3 | 31O03 | Aucun | Michel Belsile | PD | Pr | Granodiorite |
| 4 | 31O03 | Aucun | Michel Belsile | PD | Pr, E | Granite de type Guénette, secteur signalé par Suzie Nantel (MRNQ) au séminaire 1998 |
| 5 | 31J15 | — | — | PD | G | Travaux de cartographie géologique du MRNQ (SI-31J15-C3G-98K et PRO 2000-01) |
| 6 | 31J04 | 4363 | Gérard Houle | GD | E | Quartzite bleuté (avec rutile?) |
| 7 | 31G12 | 4301 | Michel Bergeron | PD | E | Diabase, pierre à monument, résultat décevant, autres travaux prévus en 2000 |
| 8 | 31G15 | 3831 | 347 1381 Canada | GD | Pr | Marbre dolomitique |
| 9 | 31I11 | 4354 | Firstake Capital | PD | Pr | Résultat décevant |
| 10 | 21E13 | 3868 | Marc-Aurèle Henri | PC | T | Production de pierre concassée prévue en 2000 |
| 11 | 31P01 | 4121-4123, 4331 | Gextrais, Louis Ouellet | PD | E | Gabbro, type Brun Castor |
| 12 | 31P01 | 4437-4440 | Daniel Robitaille | PD | E | Gabbro, type Brun Castor |
| 13 | 31P01 | 3999, 4435 | Jean-Paul Vallières Granite de la Capitale | PD | Pr, E | Poursuite des travaux en 2000, BM 731, ancien BEX 156 |
| 14 | 31I16 | 3157, BNEP 422 | Excavations Montauban | PD | E, Gc | Variété Vert Boréal, début d'exploitation en 1999 |
| 15 | 32A15 | 4262-4263 | Gextrais | PD | T, E | Farsundite, type Brun Acajou |
| 16 | 32H01 | 4256-4257, 4374 | A. Lacroix et Fils | PD | E | Projet Rivière aux Rats, granit rouge et rouge rosé, résultat encourageant, autres travaux prévus en 2000 |
| 17 | 22D13 | 3765-3769, 4358 | Gextrais, Daniel Robitaille | PD | E | Farsundite oeillée rose, variété Tiger Wood |
| 17 | 32A16 | 3797-3798 | Gextrais | PD | T, E | Farsundite oeillée rose, variété Tiger Wood |
| 18 | 22E04 | 4210-4211 | Michel Bouchard | PD | E | Projet lac Long, variété Vert Cascade, granit vert foncé, exploitation prévue en 2000 |
| 19 | 22E04 | 4404, 4419 | 9004-1344 Québec | PD | E | Farsundite, type Astra |
| 20 | 22E04 | 4357 | Louis Ouellet | PD | E | Granit brun à quartz bleu |
| 21 | 22E06 | 4227, 4229 | Ressources d'Arianne | PD | E | Projet Pinsonnault, anorthosite brune et grise |
| 22 | 22D14 | 3282 | Antoine Blackburn | PD | E | Échantillonnage d'un bloc (résultat décevant) |
| 23 | 22D12 | 3192 | 9004-1344 Québec | PD | T, E | Leucogabbronorite, type Noir Cambrien |
| 24 | 22D12 | BEX 332 | 9004-1344 Québec | PD | Pr, T, E, Gc | Leucogabbronorite type Cambrien, exploitation prévue en 2000 |
| 25 | 22D05 | 4120 | Gextrais | PD | E | Mangérite quartzifère, type Dream Green |
| 26 | 22D05 | 3770-3773, 4219, 4365, 4426-4427 | Pauline Godin-Cloutier | PD | E | Mangérite quartzifère, type Vert Saint-André, possibilité d'entente pour exploitation |
| 27 | 22D04 | 4390-4396, 4494-4498 | Famille Cloutier | PD | Pr, E | Projet PGC, granit rouge, exploitation prévue en 2000 |
| 28 | 22D04 | 4531-4542 | Fonds minier du Saguenay–Lac-Saint-Jean | PD | Pr, E, Gc | Projet Noir Laurentide, intrusif mafique noir à grain fin |
| 29 | 22D04 | 4330 | Louis Ouellet | PD | E | Jotunite quartzifère type Vert Laurentide, ancien BEX 042 |

**TABLE 2.2 – (Cont'd)**

| SITE | NTS | TITLE* | HOLDER | USE** | TYPE OF WORK*** | DETAILS |
|---|---|---|---|---|---|---|
| 30 | 22D04 | 4018-4021 | Gextrais | PD | E | Jotunite quartzifère type Vert Laurentide, autour du BEX 228 |
| 31 | 22D06 | 4165-4170 | Gextrais | PD | E | Anorthosite et diabase noires |
| 32 | 22D03 | 3967,4430 | Jean-Guy Belley | PD | Pr, E | Dolomie à stromatolite, blocs pouvant servir de pierre décorative |
| 33 | 22D02 | Aucun | Germain Boily | PD | E | Projet Mars-Moulin, granit vert |
| 34 | 22D10 | 4562-4563 | Paul Gagnon | PD | Pr | Anorthosite grise, chatoyante, ancien PRS 2985-2987 |
| 35 | 22D16 | 3731 | Guylaine Trépanier | PD | T, E | Mangérite, ancien BEX 105 |
| 36 | 22D08 | 4231 | Ressources d'Arianne | PD | Pr, T | Granit vert, ancien PRS 005, site signalé par Suzie Nantel (PRO 88-11) |
| 37 | 21M16 | 4124 | Jocelyn Bouchard | PD | T, E | Résultat moyen, visite d'acheteur potentiel |
| 38 | 21N13 | 4094-4096, 4119 | Gextrais | PD | E | Gneiss granitique rose |
| 39 | 21N07 | 3888-3889 | Glendyne | PD | G, S | Ardoise et schiste ardoisier |
| 40 | 21N07 | 3521,3523, 3525-3535, 3561-3563, 3567-3568, 3581, 3968 | Glendyne | PD | G | Schiste ardoisier |
| 41 | 22K07 | 4114-4116 | Carrières Polycor | PD | Pr | Granit rouge rosé, résultat décevant |
| 42 | 22H03 | 3637, 3786-3788 | Jean-Yves Lavoie Jean-Marc Marin | PD | G, T | Calcaire récifal de Saint-François, résultat décevant |
| 43 | 22A05 | 4269 | Françoise Bernard | PD | T, E | Basalte aphanitique noir de la formation du Lac McKay, résultat décevant |
| 44 | 22I07 | 4367-4370, 4513 | Dumas et Voyer et Maryse Gagnon | PD | E | Projet Magpie ouest, syénite brune de type Magpie |

* PRS number, unless otherwise specified.

** GD : decorative crushed-stone ; PB : building stone ; PC : crushed-stone ; PD : dimension-stone.

*** Pr : prospecting ; G : geological survey ; GC : rock geochemical survey or test ; E : sampling ; S : drilling ; T : trenching or stripping.

☐ MRN subsidized project.

**TABLE 2.3 – Exploration work in Québec in 1999 for industrial minerals (see figure 2.2).**

| SITE | TOWNSHIP OR SEIGNIORY | RESPONSIBLE | PROJECT | SUBSTANCE | WORK* |
|---|---|---|---|---|---|
| 45 | Lamotte | Ressources Raymor | Lamotte | Lithium | S, TM, EF |
| 46 | Lacorne | Ressources Canspar | Aramis | Mica | TM, EF |
| 47 | SNRC 22M/13 | SOQUEM INC | Lac Indicateur | Magnésite | TM |
| 48 | SNRC 22E/10-22E/15 | Fonds minier du Saguenay–Lac-Saint-Jean | Passes dangereuses | Apatite, titane | Pr, E |
| 49 | SNRC 22E/12 Canton 536 | Minerais Bruneau | Lac Dulain | Marbre calcitique | EF, EM,TM |
| 50 | Hudon | Baskatong Quartz | Lac Noir | Quartz (silice) | G, T, E, S |
| 51 | SNRC 22E/02 | L. Tremblay | Mirepoix | Apatite, titane | Pr, E |
| 52 | SNRC 22D/16 | G. Bouchard | Lac Emmuraillé | Quartzite (silice) | Pr, E, S |
| 53 | Champigny | G. Simard | Barycelest 1 | Barytine | Pr |
| 54 | Kenogami | Fonds minier du Saguenay–Lac-Saint-Jean | Kénogami | Feldspath | Pr, E |
| 55 | Charlevoix | France Tremblay | Lac de la Grosse Femelle | Quartzite (silice) | G, T, E |
| 56 | Décarie | M. Belisle | Lac Tapani | Mica | Pr, E |
| 57 | Derry/Portland | Ceramco | Othmer | Feldspath | G, S |
| 58 | Wakefield | D. Bilodeau | Gatineau | Lithium, apatite | Pr, E |
| 59 | Wakefield | R. & S. Fecteau | Wakefield | Brucite | Pr, E |
| 60 | Ponsoby | G. Galarneau | Ponsoby – Dolomie | Dolomie | Pr |
| 61 | Amherst | Louise Langlais | Amherst | Wollastonite | Pr, E |
| 62 | Grenville | Maxime Leduc | Grenville | Wollastonite | Pr, E |
| 63 | Seigneurie Lac-des-Deux-Montagnes | Niocan | Oka | Niobium, apatite | EE, EF |
| 64 | Upton | Ressources Robex | Upton | Barytine | ET |
| 65 | Ditton/Auckland | C. Royer | La Perle | Quartz (silice) | Gp, T |
| 66 | Dudswell | Graybec Calc | Rang des Canadiens | Calcaire | G, S, E |
| 67 | Wolfestown | C. Vachon & L. Bourgault | Binbour | Stéatite | Pr, E |
| 68 | Garthby | G. Binet / L. Fecteau | Colline Brousseau | Chromite | Pr, E |
| 69 | Coleraine | Ressources Allican | Gisement Hull | Chromite | G, S, E, EF |
| 70 | Notre-Dame-de-Portneuf | F. Bédard | Montagne de Pruche | Quartzite (silice) | Pr, T, E |
| 71 | Lesseps | J. M. Marin | Silice Pekans | Grès (silice) | G, T, E, S |
| 72 | Power/ | B. Saint-Pierre | Montagne Blanche | Calcaire | G, T, E |
| 73 | Arnaud | SOQUEM INC / Norsk Hydro | Sept-Îles | Apatite ilménite | TM, EM |

* E: sampling; EE: environnemental study; EF: feasibility study; EM: market study; ET: technical evaluation study and compilation; Gc: soil ,rock or stream geochemical survey; Gp: geophysical survey; Pr: prospecting; S: diamond drilling; T: trenching and stripping; TM: metallurgical testing.

☐ MRN subsidized project.

# Financial Assistance for mining exploration

Pierre Marcoux
Jean Choinière

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Prospectors and regional exploration funds ..... 56
Companies ..... 56
Aboriginal mining fund ..... 56

This chapter includes the mining exploration work that benefited from the ministère des Ressources naturelles (MRN) financial assistance. The subsidized work is located on figures 3.1 (prospector projects) and 3.2 (company projects). The project descriptions are found in chapters 1 and 2 of the report.

## Measures

To support mining exploration activities in Québec, the MRN is offering various financial assistance programs for the prospectors, the regional exploration funds and the companies, as well as for the aboriginal communities in the Near and Far North. These are : the Québec Mineral Exploration Program (QMEP), the Near-North Mineral Exploration Program (NNEP) and the Deep Drilling in the Abitibi Subprovince Program (DDAP).

The MRN will dedicate close to $6.8 M in various programs for the 1999-2000 financial year. The allocated sums, at December 31, 1999, by category, are :

- $1.6 M to prospectors in 258 projects ;
- $0.4 M to regional exploration funds for internal projects ;
- $4.7 M to companies for 106 exploration projects ;
- $0.3 M to an aboriginal mining fund.

## Prospectors and regional exploration funds

Under Section A of the QMEP, independent prospectors can obtain up to $4,000 in subsidy for a basic prospecting project (outside a claim) and up to $15,000 for an advanced prospecting project. The MRN has signed agreements with regional exploration funds so they can manage this section for their regions, under the same rules as elsewhere in Québec. The regions covered by the funds are the Lower St. Lawrence, the Gaspé, the Saguenay–Lac-St. Jean, the Estrie–Chaudière-Appalachians and the North-Shore, where the agreement was signed during the summer. The MRN contribution to these regional funds reaches $1,000,000.

The prospectors have submitted some 370 demands for financial assistance, for all the regions of Québec. A total of 258 projects were accepted for a financial assistance of $1,620,000, where 119 projects were managed by the MRN ($1,000,000) and 139 projects were managed by the regional funds ($620,000). The regional funds have also used the MRN subsidy balance ($380,000) for in-house prospecting projects.

## Companies

The financial assistance to the companies can reach $50,000 per project, according to Section B of the QMEP and the Deep Drilling in the Abitibi Subprovince Program. This assistance can reach $100,000 if the project is located in the Near-North territory (NNEP).

A strong demand has come from the companies with 210 projects presented, for the three programs. The sums allocated to companies by the MRN reached $4,690,000 for 106 exploration projects :

- QMEP –$1,960,000 for 55 projects ;
- NNEP – $1,560,000 for 27 projects ;
- DDAP – $1,170,000 for 24 projects including 75 drill holes (57,000 m).

The sums invested by the companies over these subsidized projects are close to $10 M, representing twice the MRN contribution.

## Aboriginal mining fund

The Nunavik Mineral Exploration Fund was granted a $300,000 financial assistance from the MRN within the QMEP. During the year, the fund has been conducting prospecting projects in the Puvirnituq, Akulivik, Kuujjuaq areas and, in partnership with Cambior, to the east of Kangiqsualujjuaq. Furthermore, about ten Inuit prospectors have been participating in different exploration projects lead by mining companies over the Nunavik territory during the summer. The Fund has also acquired two mining exploration permits in the Torngat mountains area, following Twin Gold Corporation diamond discovery.

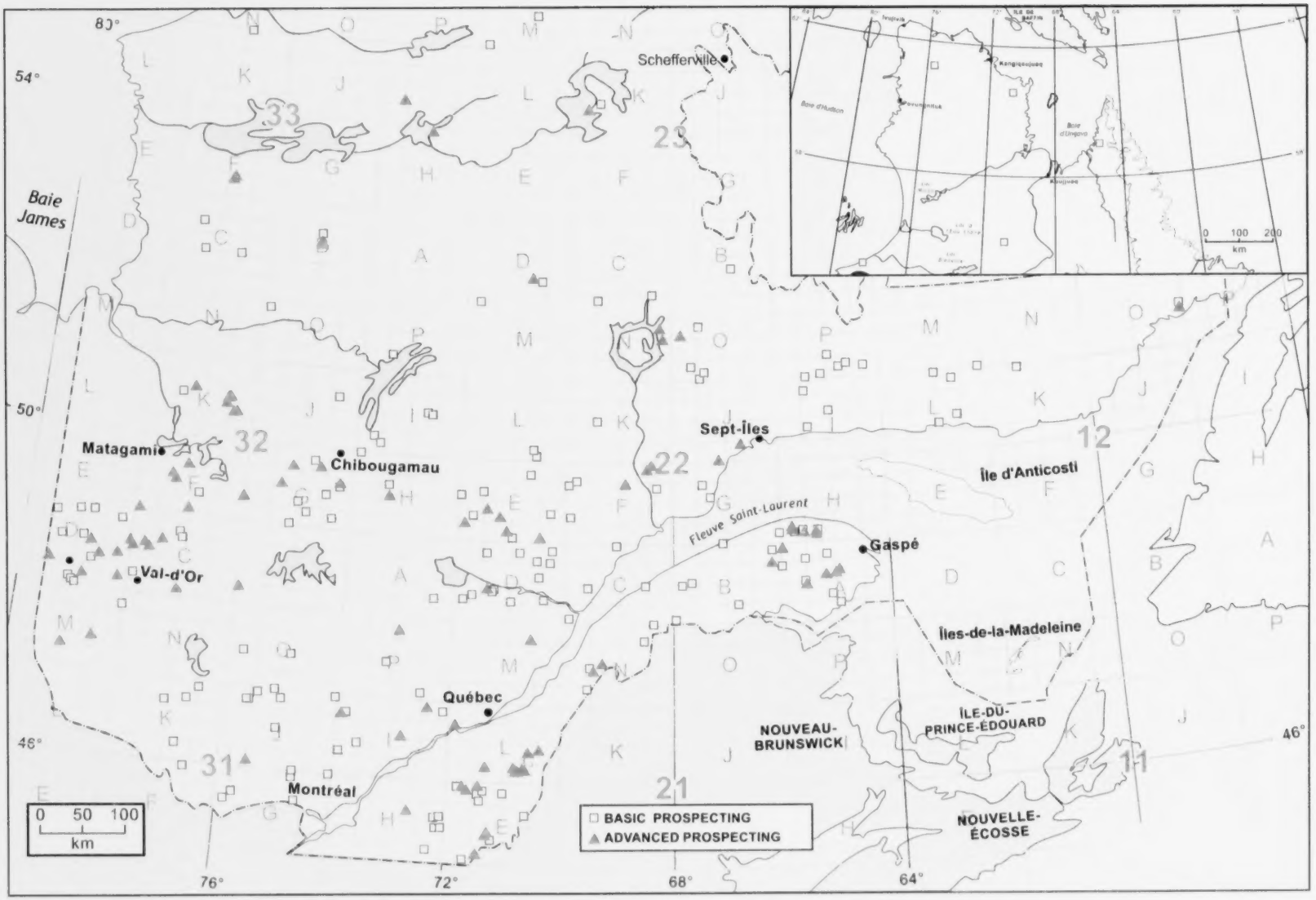


**FIGURE 3.1** — Location of basic (Section A1) and advanced (Section A2) prospecting projects subsidized by the MRN in 1999.

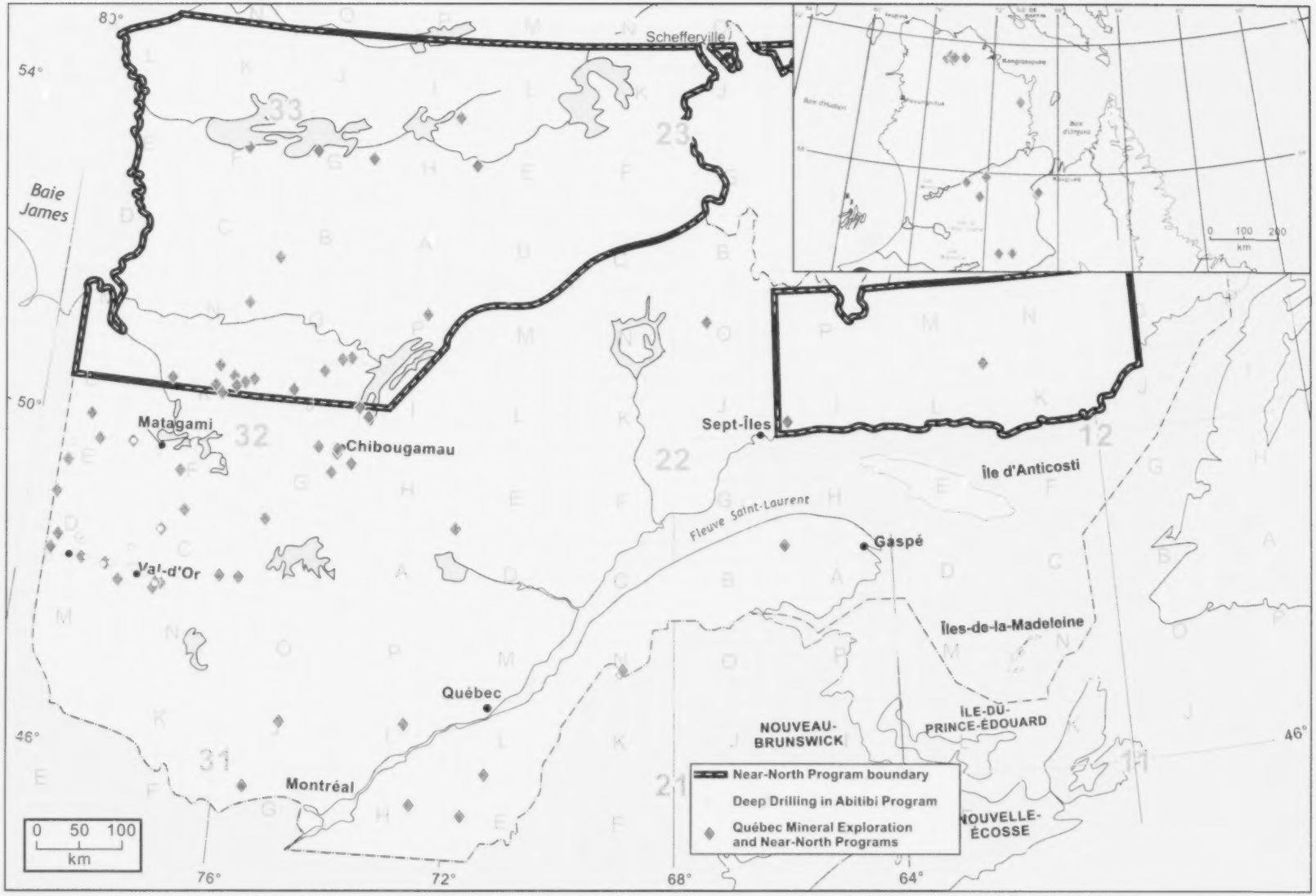


**FIGURE 3.2** – Location of MRN subsidized company projects in 1999.

# Localization of producing mines, architectural stone quarries and peat bogs in Québec

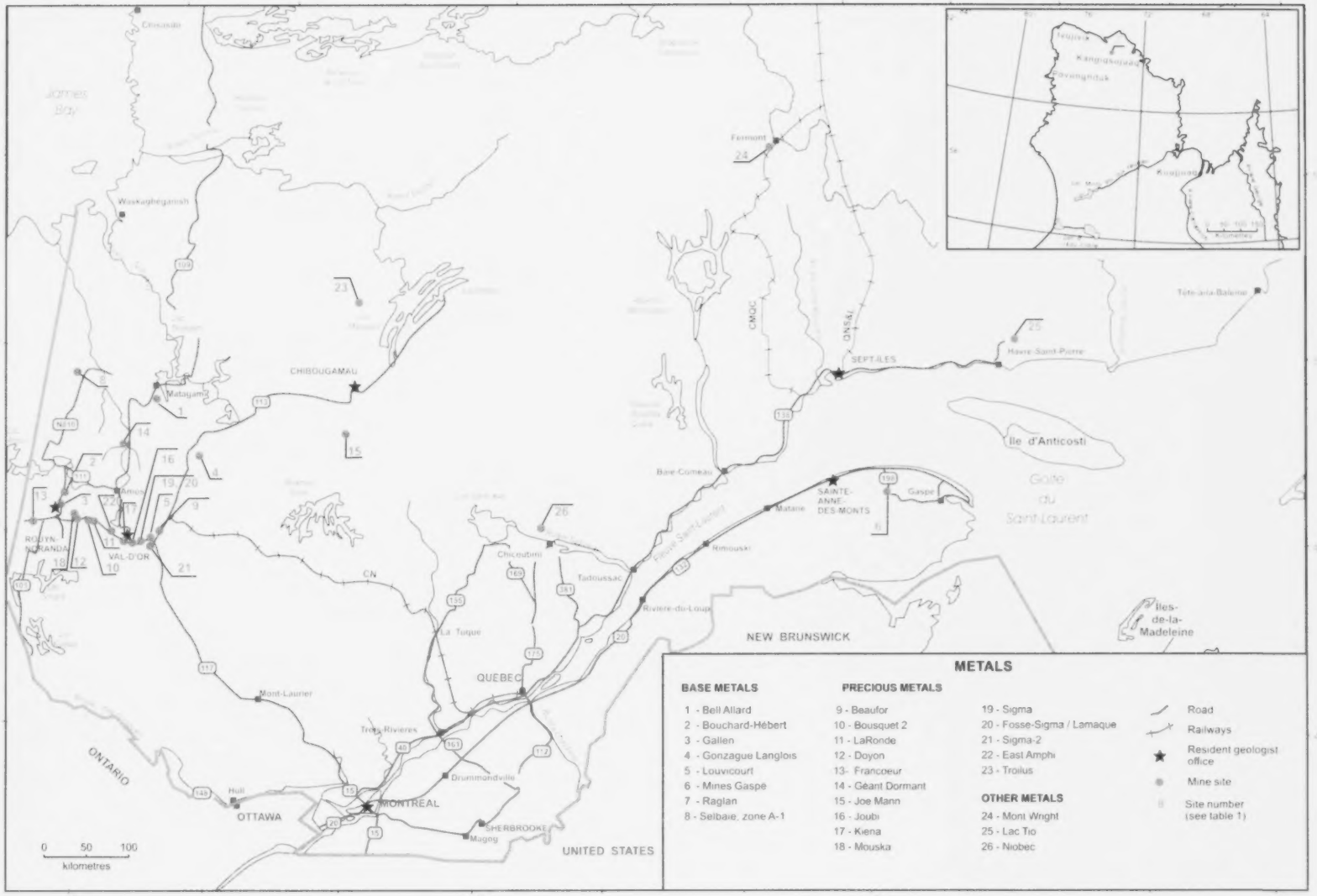


**FIGURE 1** – Active mines in Québec for 1999 (metallic substances).

**TABLEAU I – Production of metallic substances in Québec (see figure I).**

| SITE | MINE | COMPANY | SUMMARY DESCRIPTION OF THE DEPOSIT | ORE PROCESS IN 1999 | METAL PRODUCTION IN 1999 | ORE PROCESSING IN 1999 | RESERVES (AT JANUARY 1ST 2000) | EMPLOYEES IN 1999 | CUMULATIVE PRODUCTION | NUMBER OF YEARS OF PRODUCTION | TOWNSHIP / NTS / ADMINISTRATIVE AREA/ MINING DISTRICT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | **Base metals : Cu and Zn (Ag et Au)** | | | | | | |
| 1 | Bell-Allard | Noranda Inc. Matagami Mine | VMS-type | 218 753 t<br>9.51 % Zn<br>1.00 % Cu<br>26.01 g/t Ag<br>0.80 g/t Au | 18 314 t Zn<br>1 820 t Cu<br>1 998 kg Ag<br>47 kg Au | Matagami mine | 3 345 875 t<br>13.09 % Zn<br>1.27 % Cu<br>38.52 g/t Ag<br>0.692 g/t Au | 244 | | pre-production | Galinée<br>32F/12<br>**Val d'Or** |
| 2 | Bouchard-Hébert | Cambior | Massive sulfides (PY-SP-CP) subvertical lenses in rhyolites and pyroclastics | 1 054 766 t<br>1.6 g/t Au<br>50.3 g/t Ag<br>0.85 % Cu<br>4.26 % Zn | 889,5 kg Au<br>20 172 kg Ag<br>7 242 t Cu<br>37 692 t Zn | Bouchard-Hébert mine | 5 274 000 t<br>1.2 g/t Au<br>38.3 g/t Ag<br>0.71 % Cu<br>4.73 % Zn | 155 | 4 570 971 t<br>1.6 g/t Au<br>47.3 g/t Ag<br>0.88 % Cu<br>4.05 % Zn | 1995-20..<br>(5) | Dufresnoy /<br>32D/07 / 08 /<br>**Rouyn-Noranda** |
| 3 | Gallen | Noranda | Brecciated VMS (PY-SP-CP) lenses in lapilli tuff forming enclave in lac Dufault pluton. Note : The cumulative production is calculated since the re-opening of the mine in July 1997. | 706 876 t<br>0.18 % Cu<br>4.946 % Zn<br>1.185 g/t Au<br>42.36 g/t Ag | 802 t Cu<br>31 343 t Zn<br>442 kg Au,<br>10 678 kg Ag | Horne smelter | 465 000 t<br>0.16 % Cu<br>4.58 % Zn<br>0.995 g/t Au<br>29.86 g/t Ag | 11 | 1 537 671 t<br>0.17 % Cu<br>4.83 % Zn<br>1.161 g/t Au<br>37.71 g/t Ag | 1953-59,<br>1981-85,<br>1997-20..<br>(15)<br>Re-open in July 1997 | Dufresnoy /<br>32D/07 / 08 /<br>**Rouyn-Noranda** |
| 4 | Gonzague Langlois (Grevet) | Cambior | VMS-type in mafic and felsic lavas | 402 224 t<br>7.51 % Zn<br>0.37 % Cu<br>28.78 g/t Ag<br>0.16 g/t Au | 28 280 t Zn<br>1 023 t Cu<br>3176 kg Ag<br>19.1 kg Au | Gonzague Langlois mine | 5 610 000 t<br>9.45 % Zn<br>0.56 % Cu<br>43.4 g/t Ag<br>0.1 g/t Au | 166 | 1 684 436 t<br>6.78 % Zn<br>0.37 % Cu<br>28.09 g/t Ag<br>0.15 g/t Au | 1996-20..<br>(3) | Grevet /<br>32F/02 / 10 /<br>**Val-d'Or** |
| 5 | Louvicourt | Aur Resources | VMS-type associated with Val d'Or Formation, dominated by lapilli ash tuffs and exhalative chert | 1 612 475 t<br>4.16 % Cu<br>1.35 % Zn<br>28.50 g/t Ag<br>1.01 g/t Au | 65 004 t Cu<br>16 922 t Zn<br>33 337 kg Ag<br>1 198 kg Au | Louvicourt mine | N/A | 277 | 7 963 591 t<br>3.70 % Cu<br>1.55 % Zn<br>26.53 g/t Ag<br>0.99 g/t Au | 1995-20..<br>(4) | Louvicourt /<br>32C/04 / 08 /<br>**Val-d'Or** |
| 6 | Mines Gaspé | Gaspé Mines | Massive sulfides and skarn after limestones | 618 482 t<br>3.75 % Cu | 22 687 t Cu | Gaspé mine | 0 | 0 | 142 273 482 t<br>0.86 % Cu | 1955-1999<br>(44) | Holland /<br>22A/13 et A/14 / 11 /<br>Bas-St-Laurent-Gaspésie-Les Îles |
| 7 | Raglan | Falconbridge Ltd | Magmatic massive sulfides lenses at the base of ultramafic flows | 784 394 t<br>2.96 % Ni<br>0.83 % Cu<br>0.06 % Co | 20 002 t Ni<br>5 282 t Cu<br>344 t Co | Sudbury and Nikkelverk | N/A | 365 | 1 420 397 t<br>3.02 % Ni<br>0.88 % Cu<br>0.06 % Co | 1998<br>(2) | /<br>35G/09, 35H/11 and 35H/12 /<br>**Sept-Îles** |
| 8 | Selbaie, Zone A-1 and store ore | Billiton Metals of Canada | Disseminated SP-PY-CP associated with network veins in a rhyodacite breccia and dacitic welded tuff | 3 461 530 t<br>0.64 g/t Au<br>45.79 g/t Ag<br>0.60 % Cu<br>1.99 % Zn | 1 748 kg Au<br>107 298 kg Ag<br>17 755 t Cu<br>55 305 t Zn | Selbaie mine | 13 774 000 t<br>0.32 g/t Au<br>25 g/t Ag<br>0.37 % Cu<br>1.35 % Zn | 250 | 41 153 936 t<br>0.65 g/t Au<br>42.99 g/t Ag<br>1.06 % Cu<br>2.04 % Zn | 1981-20..<br>(19) | Brouillan /<br>32E/15 / 10 /<br>**Rouyn-Noranda** |

**TABLEAU I – (cont'd)**

| SITE | MINE | COMPANY | SUMMARY DESCRIPTION OF THE DEPOSIT | ORE PROCESS IN 1999 | METAL PRODUCTION IN 1999 | ORE PROCESSING IN 1999 | RESERVES (AT JANUARY 1ST 2000) | EMPLOYEES IN 1999 | CUMULATIVE PRODUCTION | NUMBER OF YEARS OF PRODUCTION | TOWNSHIP / NTS / ADMINISTRATIVE AREA / MINING DISTRICT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **Precious metals: Au and Ag** | | | | | |
| 9 | Beaufor | Mines Aurizon Ltée | Gold-bearing veins located inside of E-W shear zones at the margin of the Bourlamaque batholith. | 176 394 t<br>8.00 g/t Au | 1 272 kg Au | Camflo plant | 1 039 109 t<br>7.65 g/t Au | 110 | 624 873 t<br>8.84 g/t Au | 1996-20<br>(3) | Pascalis /<br>32C/04 / 08 /<br>**Val-d'Or** |
| 10 | Bousquet 2 | Barrick Gold Corporation | Massive and semi-massive pyrite lenses in andalusite-bearing schists | 786 800 t<br>8.1 g/t Au<br>10.0 g/t Ag<br>0.51 % Cu | 6 329 kg Au<br>7 820 kg Ag<br>4 030 t Cu | East Malartic plant | 2 560 900 t<br>6.3 g/t Au<br>8.0 g/t Ag<br>0.29 % Cu | 320 | 5 612 500 t<br>9.3 g/t Au<br>0.72 % Cu | 1990-20<br>(10) | Bousquet /<br>32D/08 / 08 /<br>**Rouyn-Noranda** |
| 11 | Donald J. LaRonde | Agnico-Eagle Mines | Massive and semi-massive pyrite lenses in sericitized felsic volcanics and metamorphosed in andalusite and kynaite-bearing schists. | 724 198 t<br>4.24 g/t Au<br>24.34 g/t Ag<br>0.302 % Cu<br>1.203 % Zn | 2 616 kg Au<br>9 789 kg Ag<br>1 576 t Cu<br>5 239 t Zn | LaRonde Division, Preissac | Shaft # 1<br>375 929 t<br>4.48 g/t Au<br>13.45 g/t Ag<br>0.34 % Cu<br>0.54 % Zn<br>Shaft # 3<br>20 492 546 t<br>2.87 g/t Au<br>93.74 g/t Ag<br>0.26 % Cu<br>5.84 % Zn | 333 | 7 332 783 t<br>6.81 g/t Au<br>11.73 g/t Ag<br>0.47 % Cu | 1988-20<br>(12) | Bousquet /<br>32D/08 / 08 /<br>**Rouyn-Noranda** |
| 12 | Doyon | Cambior | Veinlets and disseminated pyrite in sericite schists, in intermediate felsic volcanics and in Mooshla pluton. | 1 268 145 t<br>5.02 g/t Au<br>1.84 g/t Ag | 6 096 kg Au<br>2 332 kg Ag | Doyon mine | 10 320 000 t<br>6.1 g/t Au | 520 | 22 225 437 t<br>6.01 g/t Au | 1980-20<br>(20) | Bousquet /<br>32D/07 / 08 /<br>**Rouyn-Noranda** |
| 13 | Francoeur | Mines Richmont | Carbonate, albite, quartz and sericite lenses associated with the Francoeur-Wasa shear zone. | 100 435 t<br>5.39 g/t Au | 582.22 kg Au | Camflo plant | 1 195 338 t<br>6.03 g/t Au | 86 | 1 450 705 t<br>6.24 g/t Au | 1988-20<br>(12) | Beauchastel /<br>32D/03 / 08 /<br>**Rouyn-Noranda** |
| 14 | Géant Dormant | Cambior et Mines Aurizon | Gold-bearing quartz and sulfides veins at contact between dacitic intrusions and lava flows | 208 408 t<br>12.0 g/t Au<br>13.5 g/t Ag | 2 348 kg Au<br>2 233 kg Ag | Géant Dormant | 616 606 t at<br>10.7 g/t Au | 181 | 1 510 337 t<br>9.72 g/t Au | 1989-20<br>(10) | Chaste /<br>32F/04 / 10 /<br>**Val-d'Or** |
| 15 | Joe Mann | Meston Resources | Sulfides-bearing quartz veins in gabbro and sheared rhyolite. | 237 122 t<br>0.23 % Cu<br>7.23 g/t Au<br>4.56 g/t Ag | 534 t Cu<br>1 714.1 kg Au<br>1 066.7 g/t Ag | Merrill Island, Meston Resources's mill | 1 085 215 t<br>10.70 g/t Au<br>0.25 % Cu<br>4.59 g/t Ag | 220 | 3 547 376 t<br>8.70 g/t Au<br>0.23 % Cu | 1956-1959<br>1974-1975<br>1987-20<br>(16) | Rohault /<br>32G/08 / 10 /<br>**Chibougamau** |
| 16 | Joubi | Mines Western Québec inc. | Disseminated fine grained gold-bearing pyrite in a sheared contact between porphyry and basalt. | 16 214 t<br>6.94 g/t Au | 107 kg Au | Camflo plant | 0 | 4 at the end of the year | 327 561 t<br>6.14 g/t Au | 1991-2000<br>(9) | Dubuisson /<br>32C/04 / 08<br>**Val d'Or** |
| 17 | Kiena | McWatters Mines | Auriferous breccia and quartz veins localized between two komatiite flows | 664 906 t<br>4.25 g/t Au | 2 694 kg Au | Kiena mine | 2 629 000 t<br>4.51 g/t Au<br>(01-01-1999) | 174 | 8 831 815 t<br>5.01 g/t Au | 1981-20<br>(17) | Dubuisson /<br>32C/04 / 08 /<br>**Val-d'Or** |

**TABLEAU I – (cont'd)**

| SITE | MINE | COMPANY | SUMMARY DESCRIPTION OF THE DEPOSIT | ORE PROCESS IN 1999 | METAL PRODUCTION IN 1999 | ORE PROCESSING IN 1999 | RESERVES (AT JANUARY 1ST 2000) | EMPLOYEES IN 1999 | CUMULATIVE PRODUCTION | NUMBER OF YEARS OF PRODUCTION | TOWNSHIP / NTS / ADMINISTRATIVE AREA/ MINING DISTRICT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 18 | Mouska | Cambior | Quartz veins in the Mooshla diorite close to the northern sheared contact | 88 560 t<br>16.79 g/t Au | 1 396 kg Au | Doyon mine | 302 500 t<br>15.23 g/t Au | 133 | 975 290 t<br>10.06 g/t Au | 1991-20..<br>(9) | Bousquet /<br>32D/07 / 08 /<br>**Rouyn-Noranda** |
| 19 | Sigma et Sigma No 3 | McWatters Mines | Subhorizontal auriferous tourmaline-bearing quartz-pyrite veins in shear zones | N/A | N/A | Sigma mine | N/A | N/A | N/A | 1938-20..<br>(62) | Bourlamaque /<br>32C/04 / 08 /<br>**Val-d'Or** |
| 20 | Fosse-Sigma / Lamaque | McWatters Mines | Subhorizontal auriferous tourmaline-bearing quartz-pyrite veins in shear zones | 679 727 t<br>3.26 g/t Au | see Sigma | Sigma mine | N/A | N/A | N/A | | Bourlamaque /<br>32C/04 / 08 /<br>**Val-d'Or** |
| 21 | Sigma No. 2 | McWatters Mines | Auriferous tourmaline-bearing quartz-pyrite veins with spectacular arseno-pyrite alteration close to the veins. | N/A | N/A | N/A | N/A | N/A | N/A | 1984-1998<br>(15) | Louvicourt /<br>32C/03 / 08 /<br>**Val-d'Or** |
| 22 | East Amphi | McWatters Mines | | 118 213 t<br>4.52 g/t Au | 487.7 kg Au | Sigma mine | N/A | N/A | N/A | Production between April and July 1999 | Malartic /<br>32D/01<br>**Val-d'Or** |
| 23 | Troilus | Inmet Mining Corporation | Au-Cu porphyry in diorite | 4 853 507 t<br>0.126 % Cu<br>1.26 g/t Au<br>1.24 g/t Ag | 5 493 t Cu<br>5 239.5 kg Au<br>6 041.8 kg Ag | Troilus mine | 44 394 000 t<br>0.094 % Cu<br>0.962 g/t Au | 300 | 13 553 000 t<br>0.126 % Cu<br>1.336 g/t Au | 1997-20..<br>(2) | /<br>32O/01 / 10 /<br>**Chibougamau** |

| SITE | MINE | COMPANY | SUMMARY DESCRIPTION OF THE DEPOSIT | TOTAL PRODUCTION IN 1999 | TOTAL SHIPMENT IN 1999 | SHIPMENT OF IRON PELLETS IN 1999 | SHIPMENT OF CONCENTRATE IN 1999 | RESERVES (AT JANUARY 1ST 2000) | CUMULATIVE PRODUCTION | YEARS OF PRODUCTION | TOWNSHIP / NTS / ADMINISTRATIVE AREA/ MINING DISTRICT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 24 | Mt. Wright | Quebec Cartier Mining | Specular hematite in metamorphosed iron formation of the Gagnon Group | 13.6 Mt | 15.17 Mt | 8.8 Mt | 6.3 Mt | 850 Mt iron ore | N/A | 1976-20..<br>(24) | Normanville / 23B/14, 23B/11 et 23B/09 / 09 /<br>**Sept-Îles** |
| 25 | Lac Tio | QIT | Massive hemo-ilmenite in anorthosite associated with the Havre-Saint-Pierre intrusive suite. | N/A | N/A | N/A | N/A | N/A | N/A | 1950-20..<br>(50) | Parker/<br>12L/09 et L/11 / 09 /<br>**Sept-Îles** |
| 26 | Niobec | Les Services T.M.G. | Pyrochlore in the St-Honoré carbonatite | 820 000 t<br>0.72 % $Nb_2O_5$ | 2 178 t<br>ferroniobium | — | — | 10.6 Mt<br>0.73 % $Nb_2O_5$ | N/A | 1976-20..<br>(24) | Simard /<br>22D/11 / 05 /<br>**Montréal-Estrie-Laurentides** |

**Abbreviation list**

Au : Gold
Ag : Silver
Cu : Copper
BO : Biotite
CP : Chalcopyrite
PO : Pyrrhotite
PY : Pyrite
Nb : Niobium
SP : Sphalerite
Zn : Zinc
VMS : Volcanogenic massive sulfides
Ni : Nikel
Na : Non available
t : metric ton

**NOTE. The data compiled in this table are preliminary and have been collected from mining companies before they published their financial statements.**

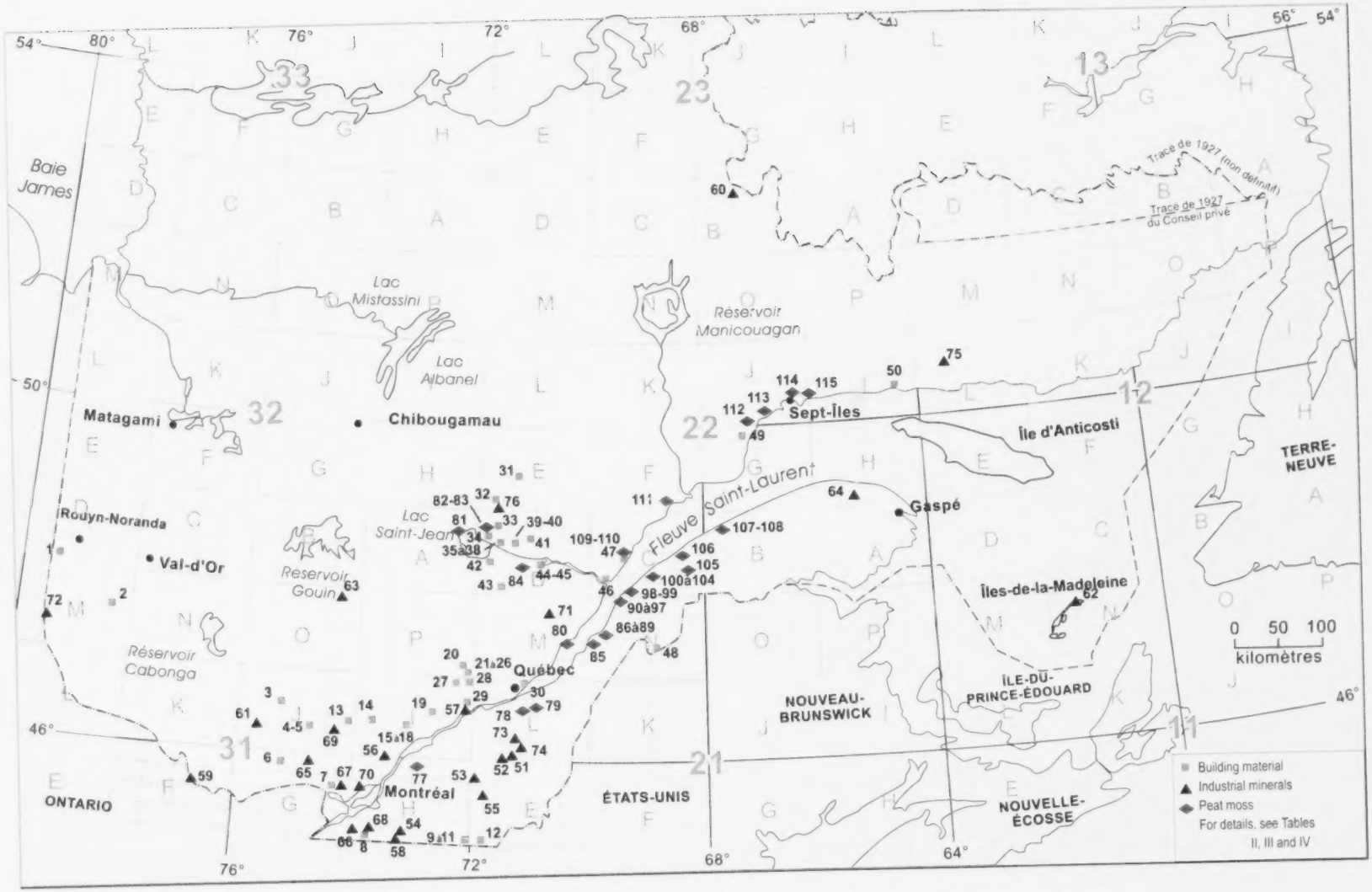


**FIGURE II** – Mining activities in Québec in 1999. Building material, industrial minerals and peat moss.

**TABLE II – Architectural stone quarries exploited in Québec in 1999 (see figure II).**

| SITE | LOCATION | COMPANY | ROCK TYPE / PRODUCTS* | COMMERCIAL NAME | TOWNSHIP / NTS / ADMINISTRATIVE REGION | TITLE |
|---|---|---|---|---|---|---|
| 1 | Beaudry | Gérard Houle | Schiste du groupe de Pontiac / 3 | — | Montbeillard / 32D03 / 08 | BEX 086 |
| 2 | Winneway | Groupe Polycor | Granite rose à grain fin / 1 | Golden | Hallé / 31M09 / 08 | BEX 323 |
| 3 | Guénette | Rock of Ages du Canada | Monzogranite rose rougeâtre, à grain fin à moyen / 1, 2 | Rose Laurentien | Campbell / 31J11 / 15 | CM 079 |
| 4 | Labelle | Robert Durand | Paragneiss quartzofeldspathique | — | Joly / 31J07 / 15 | BEX 076 |
| 5 | Labelle | Les Pierres H.L.P. | Paragneiss quartzofeldspathique / 3 | — | Marchand / 31J07 / 15 | BEX 197 |
| 6 | Montpellier | Granite du Rat Musqué | Gabbro (diabase) à grain moyen / 2 | Noir Montpellier | Lathbury / 31G14 / 07 | BEX 265 |
| 7 | Saint-Canut | Les Pierres Saint-Canut | Grès beige crème / 3 | Grès de Saint-Canut | Seigneuri Lac-des-Deux-Montagnes 3 / 31G09 / 15 | Aucun |
| 8 | Havelock | Les Carrières Ducharme | Grès gris et beige / 3 | Grès d'Hemmingford | Havelock / 31H04 / 16 | Aucun |
| 9 | Stanstead | Groupe Polycor | Granite gris, à grain moyen / 1, 2 | Gris de Stanstead | Stanstead / 31H01 / 05 | Aucun |
| 10 | Stanstead | Rock of Ages du Canada | Granite gris, à grain moyen / 1, 2 | Gris de Stanstead | Stanstead / 31H01 / 05 | Aucun |
| 11 | Stanstead | | Granite gris à grain moyen / 2 | Gris Bofalec | Stanstead / 31H01 / 05 | Aucun |
| 12 | Stanhope | Granicor | Granite blanc à grain moyen / 1 | Blanc Neige | Barnston / 21E04 / 05 | Aucun |
| 13 | Saint-Donat-de-Montcalm | Carrières F.L. | Gneiss granitique rose brunâtre, à grain fin / 3 | — | Lussier / 31J08/14 | BEX 140 |
| 14 | Saint-Zénon | Service de pourvoyeur Trudeau | Mangérite granoclastique gris verdâtre / 2 | Vert Mattawin | Courcelle / 31I05 / 14 | BEX 088 |
| 15 | Saint-Alexis-des-Monts | Groupe Polycor | Mangérite quartzifère brune, à grain grossier / 1, 2, 3 | Newton | Hunterstown / 31I06 / 04 | Aucun |
| 16 | Saint-Alexis-des-Monts | Firstake Capital | Mangérite quartzifère brune, à grain grossier / 3, 4 | Brun Diamant | Hunterstown / 31I06 / 04 | BEX 174 |
| 17 | Saint-Alexis-des-Monts | Les Carrières Diamond | Mangérite quartzifère brune et orange, à grain grossier / 3, 4 | Brun Diamant, Auburn | De Calonne / 31I06 / 04 | Aucun |
| 18 | Saint-Didace | A. Lacroix et Fils | Mangérite quartzifère porphyroïde à grain grossier, brun rougeâtre / 1 | Rouge Nordique | Hunter (Lanaudière) / 31I06 / 14 | Aucun |
| 19 | Shawinigan | Les Entreprises Élie Grenier | Gneiss oeillé / 3 | – | Shawinigan / 31I10 / 04 | Aucun |
| 20 | Rivière-à-Pierre | A. Lacroix et Fils | Mangérite quartzifère porphyroïde, gris noirâtre, à grain grossier / 1 | Bleu Atlantique | Bois / 31P01 / 03 | BEX 178 |
| 21 | Rivière-à-Pierre | Granicor | Mangérite quartzifère et farsundite gris brunâtre à gris orangé, porphyroïde à grain grossier / 1, 4 | Nara Brown | Bois / 31P01 / 03 | BEX 231 |
| 22 | Rivière-à-Pierre | Granicor | Mangérite et jotunite quartzifère gris à noir verdâtre, porphyroïde à grain grossier / 1 | Vert Prairie, Dark Steel | Bois / 31P01 / 03 | BEX 165 |

**TABLE II – (cont'd)**

| SITE | LOCATION | COMPANY | ROCK TYPE / PRODUCTS* | COMMERCIAL NAME | TOWNSHIP / NTS / ADMINISTRATIVE REGION | TITLE |
|---|---|---|---|---|---|---|
| 23 | Rivière-à-Pierre | Granicor | Farsundite gris brunâtre à rosé, porphyroïde, à grain grossier / 1 | Newport, Abbey Rose | Bois / 31P01/03 | Aucun |
| 24 | Rivière-à-Pierre | A. Lacroix et Fils | Farsundite gris brunâtre à verdâtre, porphyroïde à grain grossier / 1 | Deer Brown, Vert Atlantique, Deer Brown D.D. | Bois / 31P01 / 03 | BM 723 BM 746 |
| 25 | Rivière-à-Pierre | Groupe Polycor | Farsundite gris brunâtre, porphyroïde à grain grossier / 1, 4 | Calédonia | Bois / 31P01 / 03 | Aucun |
| 26 | Rivière-à-Pierre | Groupe Polycor | Farsundite gris brunâtre, porphyroïde à grain grossier / 1, 4 | Calédonia | Bois / 31P01 / 03 | BEX 033 |
| 27 | Rivière-à-Pierre | Excavations Montauban et Groupe Polycor | Mangérite quartzifère porphyroïde gris verdâtre / 1 | Vert Boréal | Chavigny / 31I16 / 03 | BNEP422 |
| 28 | Rivière-à-Pierre | Groupe Polycor | Farsundite porphyroïde, gris rose à grain grossier / 1 | Grand Calédonia | Colbert / 31I16 / 03 | BEX 114 |
| 29 | Saint-Marc-des-Carrières | Les Carrières Saint-Marc-des-Carrières | Calcaire gris / 1 | Calcaire Saint-Marc | Seigneurie La Chevrotière / 31I09 / 03 | Aucun |
| 30 | Château-Richer | Carrière Laplante | Calcaire gris brunâtre / 3 | — | Seigneurie Côte-de-Beaupré / 21L14 / 03 | Aucun |
| 31 | Saint-Ludger-de-Milot | Granite Péribonka | Monzogabbro à grain grossier, gris brunâtre / 2 | Brun Mystique | Pinsonnault / 22E06 / 02 | BEX 299 |
| 32 | Saint-Ludger-de-Milot | Groupe Polycor | Farsundite rose grisâtre à grain grossier / 1 | Astra | Petit / 22E04 / 02 | BEX 001 |
| 33 | Chute-du-Diable | Granicor | Anorthosite noire à grain grossier / 1 ,2 | Noir Péribonka | Garnier / 22D13 / 02 | Aucun |
| 34 | Saint-Henri-de-Taillon | Groupe Polycor | Anorthosite noire à grain grossier / 1, 2 | Noir Taillon | Taillon / 22D12 / 02 | Aucun |
| 35 | Saint-Nazaire | Groupe Polycor | Leucogabbronorite à biotite, noire, à grain moyen à grossier / 1, 2 | Noir Cambrien | Taché / 22D12 / 02 | BM 705 |
| 36 | Saint-Nazaire | A. Lacroix et Fils | Leucogabbronorite à olivine, noir grisâtre, à grain grossier / 1 | Noir Atlantique Vert Forêt, Vert Nordique | Taché / 22D12 / 02 | BEX 148 |
| 37 | Saint-Nazaire | A. Lacroix et Fils | Leucogabbronorite à olivine, noir verdâtre, à grain grossier / 1, 2 | Vert Nordique Noir Atlantique | Taché / 22D12 / 02 | Aucun |
| 38 | Saint-Nazaire | Investrock | Anorthosite porphyroclastique, chatoyant / 1 | Mona Lisa | Taché / 22D12 / 02 | Aucun |
| 39 | Bégin | A. Lacroix et Fils | Mangérite quartzifère rose grisâtre, porphyroïde à grain grossier / 1 | Rose Atlantique | Bégin / 22D11 / 02 | Aucun |
| 40 | Bégin | Granite Aurélien Tremblay | Mangérite quartzifère rose grisâtre, porphyroïde à grain grossier | Rose Sauvage | Bégin / 22D11 / 02 | Aucun |
| 41 | Saint-Honoré | Les Pierres Naturelles Tremblay | Calcilutite gris noirâtre / 3 | — | Falardeau / 22D11 / 02 | Aucun |
| 42 | Métabetchouan | Groupe Polycor | Farsundite porphyroïde rose orangé, à grain grossier / 1 | Betchouan Violetta | Caron / 22D05 / 02 | Aucun |

**TABLE II – (cont'd)**

| SITE | LOCATION | COMPANY | ROCK TYPE / PRODUCTS* | COMMERCIAL NAME | TOWNSHIP / NTS / ADMINISTRATIVE REGION | TITLE |
|---|---|---|---|---|---|---|
| 43 | Mont-Apica | Groupe Polycor | Jotunite quartzifère verte, à grain grossier / 1, 2 | Vert Laurentide | Lac Saint-Jean-2 / 22D04 / 03 | BEX 210 |
| 44 | La Baie | Groupe Polycor | Farsundite porphyroïde, brun orangé, à grain grossier / 1 | Polychrome | Bagot / 22D07 / 02 | Aucun |
| 45 | La Baie | Granicor | Farsundite porphyroïde, brun orangé à grain grossier / 1 | Polychrome | Bagot / 22D07 / 02 | Aucun |
| 46 | Grandes-Bergeronnes | Granicor | Orthogneiss rose à grain moyen / 1 | Tadoussac | Bergeronnes / 22C04 / / 09 | Aucun |
| 47 | Escoumins | Groupe Polycor | Syénogranite rose à grain grossier / 1 | Béluro | Bergeronnes / 22C06 / 09 | BEX 003 |
| 48 | Saint-Marc-du-Lac-Long | Carrière Glendyne | Ardoise noire / 5 | La Canadienne, Glendyne Slate, North Country Black | Bostford / 21N07 / 01 | Aucun |
| 49 | Rivière-Pentecôte | Groupe Polycor | Anorthosite gris noirâtre à grain grossier / 1 | Noir Nordic | –/22G14 / 09 | BEX 155 |
| 50 | Magpie | Groupe Polycor | Syénite à hypersthène, brun à rose brunâtre à grain moyen / 1 | Magpie | Fornel / 22I08 / 09 | BEX 091 |

* 1- Dimensional stone; 2- Tombstone; 3- Building stone, paving stone; 4- Curbstones; 5- Roofing tiles.

**TABLE III – Industrial minerals quarries in production in Québec in 1999 (see figure II).**

| SITE | QUARRY | COMPANY | SUMMARY DESCRIPTION OF DEPOSIT | PRODUCTS | TOWNSHIP / NTS ADMINISTRATIVE REGION |
|---|---|---|---|---|---|
| | | | **Asbestos (chrysotile)** | | |
| 51 | Bell | LAB Chrysotile | Réseau de veines (stockwerk) dans des ultramafites serpentinisées | Fibres | Thetford / 21L03/ 12 |
| 52 | Black Lake | LAB Chrysotile | Réseau de veines (stockwerk) dans des ultramafites serpentinisées | Fibres | Ireland / 21L03 / 12 |
| 53 | Jeffrey | JM Asbestos | Réseau de veines (stockwerk) dans des ultramafites serpentinisées | Fibres | Shipton / 21E13 / 12 |
| | | | **High purity limestone** | | |
| 54 | Bedford | Graybec Calc | Calcaire de la Formation de Corey | Chaux vive, produits de calcaire broyé pour usage industriel, pierre concassée | Stanbridge / 31H03 / 16 |
| 55 | Domlin | Graybec Calc | Calcaire du Groupe du Lac Aylmer | Chaux vive, produits de calcaire broyé pour usage industriel, pierre concassée | Dudswell / 21E12 / 12 |
| 56 | Jolichaux | Graybec Calc | Calcaire de la Formation de Deschambault | Chaux vive, produits de calcaire broyé pour usage industriel, pierre concassée | Lavaltrie / 31I03 / 14 |
| 57 | Calco | Cogeneuf | Calcaire de la Formation de Deschambault | Pierre concassée, produits de calcaire broyé pour usage industriel | Seigneurie de Grondines / 31I09 / 03 |
| 58 | Saint-Armand Ouest | Compléments industriels | Marbre de Strites Pond | Calcaire pulvérisé pour charges minérales | Seigneurie de Saint-Armand / 31H03 / 16 |
| | | | **High purity dolomite and dolomitic marble** | | |
| 59 | Portage-du-Fort | Dolomex | Marbre dolomitique pur | Granules blancs, produit broyé pour usage industriel (verre, agriculture, etc.) | Litchfield / 31F10 / 07 |
| | | | **Iron** | | |
| 60 | Mont-Wright | La Compagnie minière Québec Cartier | Hématite (spéculaire) dans les formations de fer métamorphisées du Groupe de Gagnon | Concentré et boulettes de fer pour acier et métallurgie; produits de sablage au jet | Normanville / 23B14 et 23B11 / 09 |
| | | | **Graphite** | | |
| 61 | Stratmin | Stratmin Graphite (division Lac-des-Îles) | Graphite en paillettes disséminées dans des calcaires cristallins (±quartzite) | Paillettes pour réfractaires, acier, moules de fonderie, lubrifiant, garniture de freins | Bouthillier / 31J05 / 15 |
| | | | **Halite** | | |
| 62 | Seleine | La Société canadienne de sel (division Mine Seleine) | Dôme de sel | Sel déglaçant | Îles-de-la-Madeleine / 11N12 / 11 |
| | | | **Micas** | | |
| 63 | Letondal | Les Produits Mica Suzorite | Intrusion alcaline lenticulaire contenant 80-85% phlogopite (variété suzorite) | Mica broyé pour charges minérales (ciment à joint, plastique) et boues de forage | Suzor / 31O16 / 04 |

**TABLE III – (cont'd)**

| SITE | QUARRY | COMPANY | SUMMARY DESCRIPTION OF DEPOSIT | PRODUCTS | TOWNSHIP / NTS ADMINISTRATIVE REGION |
|---|---|---|---|---|---|
| | | | **Silica** | | |
| 64 | Grande Vallée | J.B. J. Gauthier | Grès de Kamouraska | Fondant siliceux | Denoue / 22H03 / 11 |
| 65 | Saint-Rémi d'Amherst | Société minière Gerdin | Quartzite | Agrégats pour briques, sable de silice pour cimenterie | Amherst / 31G15 / 15 |
| 66 | Ormstown | La Cie Bon Sable (division Ormstown) | Sable naturel | Sable lavé pour sablage au jet, fonderie, mélange pour colle à céramique | Beauharnois-2 / 31H04 / 16 |
| 67 | Saint-Canut | Unimin Canada (division Saint-Canut) | Grès de Postdam | Sable pour verre, sablage au jet, filtre, céramique | Lac-des-Deux-Montagnes- 3 / 31G09 / 15 |
| 68 | Sainte-Clotilde | Les Sables Silco | Grès de Postdam | Pierre concassée riche en silice pour cimenterie et ferro-silicium | Beauharnois-1 / 31H04 / 16 |
| 69 | Saint-Donat | Unimin Canada (division Saint-Donat) | Quartzite | Sable pour le carbure de silicium | Lussier / 31J08 / 14 |
| 70 | Saint-Joseph-du-Lac | La Cie Bon Sable | Sable naturel | Sable lavé pour la maçonnerie et le sablage au jet | Lac-des-Deux-Montagnes-1 / 31H12 / 15 |
| 71 | SKW Zones A et B | Baskatong Quartz | Quartzite | Quartz en morceaux pour le silicium métal et sable de silice pour le carbure de silicium | Charlevoix / 21M15 / 03 |
| 72 | Saint-Bruno-de-Guigues | Temisca Silice | Grès d'âge Ordovicien | Sables pour filtration fonderie, fracturation hydraulique | Guigues / 31M05 / 08 |
| | | | **Talc and steatite** | | |
| 73 | Saint-Pierre-de-Broughton | Luzenac | Schiste à talc-carbonate | Produits de talc moulu, non purifiés | Leeds / 21L06 / 12 |
| 74 | Fraser | Luzenac | Stéatite | Blocs pour sculpture, plaques réfractaires | Broughton / 21L03 / 12 |
| | | | **Titanium** | | |
| 75 | Lac Tio | QIT - Fer et Titane | Hémo-ilménite massive dans l'anorthosite du Complexe d'Havre-Saint-Pierre | Scories de titane (Sorel slag) pour la production de pigments et de fer de refonte, ilménite concassée (Sorel flux) | Parker / 12L09 et 12L11 / 09 |
| | | | **Wollastonite** | | |
| 76 | Saint-Onge | Ressources Orléans | Skarn à wollastonite – diopside | Concentrés de wollastonite | Saint-Onge / 22E04 / 02 |

**TABLE IV – Peat bogs in exploitation in Québec in 1999 (see figure II).**

| SITE | PEAT BOG (DEPOSIT) | COMPANY | PRODUCTS | TOWNSHIP / NTS ADMINISTRATIVE REGION |
|---|---|---|---|---|
| 77 | Saint-Bonaventure | Fafard et Frères (division Saint-Bonaventure) | Tourbe de sphaignes, terreaux, composts, biofiltres | Upton / 31H15 / 04 |
| 78 | Saint-Henri-de-Lévis | Premier Horticulture (division Saint-Henri) | Tourbe de sphaignes | Seigneurie Lauzon / 21L11 / 12 |
| 79 | Saint-Charles | Les tourbes M.L. (division Saint-Charles) | Tourbe de sphaignes | Seigneurie Lauzon et fief de La Martinière (Beauchamp) / 21L10 / 12 |
| 80 | Île aux Coudres | Tourbière Pearl | Tourbe de sphaignes | Seigneurie Île-aux-Coudres / 21M08 / 03 |
| 81 | Sainte-Marguerite | Fafard et Frères (division Sainte-Marguerite) | Blocs de tourbe de sphaignes | Racine / 32A16 / 02 |
| 82 | L'Ascension Ouest | Tourbières Lambert (division L'Ascension) | Tourbe de sphaignes | Garnier / 22D13 / 02 |
| 83 | Saint-Ludger-de-Milot SW | Fafard et Frères (division Milot) | Tourbe de sphaignes | Milot / 22D13 / 02 |
| 84 | La Baie | Tourbières Blocs Dorés | Blocs de tourbe de sphaignes | Bagot / 22D7 / 02 |
| 85 | Riviere Ouelle | Tourbières Lambert (division Rivière Ouelle) | Tourbe de sphaignes, terreaux, mousse florale | Seigneurie Rivière-Ouelle / 21N05 / 01 |
| 86 | Saint-Alexandre | Tourbière Saint-André | Tourbe de sphaignes | Seigneuries Islets-du-Portage et Lachenaye / 21N12 / 01 |
| 87 | Saint-Alexandre | Tourbière Saint-Alexandre | Tourbe de sphaignes | Seigneuries Islets-du-Portage et Lachenaye / 21N12 / 02 |
| 88 | Saint-Alexandre | Tourbière Mouska | Tourbe de sphaignes | Seigneuries Islets-du-Portage et Lachenaye / 21N12 / 03 |
| 89 | Notre-Dame-du-Portage | Premier Horticulture (division Tardif) | Tourbe de sphaignes | Seigneurie Terrebois / 21N12 / 01 |
| 90 | Rivière-du-Loup | Premier Horticulture (division Premier) | Tourbe de sphaignes, terreaux, composts, endomycorrhyzes, biofiltres | Seigneuries Rivière-du-Loup et Cacouna / 21N13-14 / 01 |
| 91 | Rivière-du-Loup | Premier Horticulture (division Verbois) | Tourbe de sphaignes | Seigneuries Rivière-du-Loup et Cacouna / 21N13-14 / 01 |
| 92 | Rivière-du-Loup | Premier Horticulture (division Saint-Laurent) | Tourbe de sphaignes | Seigneuries Rivière-du-Loup et Cacouna / 21N13-14 / 01 |
| 93 | Rivière-du-Loup | Tourbière Michaud ltée | Tourbe de sphaignes | Seigneuries Rivière-du-Loup et Cacouna / 21N13-14 / 01 |
| 94 | Rivière-du-Loup | Les tourbes M.L. (division Rivière-du-Loup) | Tourbe de sphaignes | Seigneuries Rivière-du-Loup et Cacouna / 21N13-14 / 01 |
| 95 | Rivière-du-Loup | Tourbière Berger inc. | Tourbe de sphaignes, terreaux | Seigneuries Rivière-du-Loup et Cacouna / 21N13-14 / 01 |
| 96 | Rivière-du-Loup | Tourbière Henri Théberge et associés | Tourbe de sphaignes | Seigneuries Rivière-du-Loup et Cacouna / 21N13-14 / 01 |
| 97 | Rivière-du-Loup | Tourbière Omer Bélanger | Tourbe de sphaignes | Seigneuries Rivière-du-Loup et Cacouna / 21N13-14 / 01 |
| 98 | Isle-Verte, EST | Tourbière Réal Michaud et fils | Tourbe de sphaignes | Seigneurie Isle-Verte / 22C03 / 01 |
| 99 | Isle-Verte, SW | Tourbière Ouellet et fils | Tourbe de sphaignes | Seigneurie de Villeray / 21N14 / 01 |
| 100 | Saint-Eugène-de-Ladrière | La tourbière Yvon Bélanger | Tourbe de sphaignes | Seigneurie Nicolas-Rioux 03 / 22C07 / 01 |
| 101 | Saint-Fabien-sur-Mer | La tourbière Rio-Val | Tourbe de sphaignes | Seigneurie Nicolas-Rioux 03 / 22C07 / 01 |
| 102 | Saint-Fabien-sur-Mer | Tourbière de la Mer | Tourbe de sphaignes | Seigneurie Nicolas-Rioux 03 / 22C07 / 01 |
| 103 | Saint-Fabien | Tourbière du Port-Pic | Tourbe de sphaignes | Seigneurie Nicolas-Rioux 03 / 22C07 / 01 |
| 104 | Saint-Fabien | Tourbière Berger inc. (division Saint-Fabien) | Tourbe de sphaignes | Seigneurie Nicolas-Rioux 03 / 22C07 / 01 |
| 105 | Lac Malobès | Flo Mar Peat Moss | Blocs de tourbe de sphaignes | Seigneurie Nicolas-Rioux / 22C7 / 01 |
| 106 | Pointe-au-Père | Premier Horticulture (division Pointe-au-Père) | Tourbe de sphaignes | Seigneurie Lessard / 22C09 / 01 |
| 107 | Rivière-Blanche | Premier Horticulture (division Saint-Ulric) | Tourbe de sphaignes | Matane / 22B13 / 01 |

**TABLE IV – (cont'd)**

| SITE | PEAT BOG (DEPOSIT) | COMPANY | PRODUCTS | TOWNSHIP / NTS ADMINISTRATIVE REGION |
|---|---|---|---|---|
| 108 | Saint-Ulric | Les tourbes M.L. (division Saint-Ulric) | Tourbe de sphaignes | Matane / 22B13 / 01 |
| 109 | Les Escoumins | Tourbières Lambert (division Anse-aux-Basques) | Tourbe de sphaignes | Bergeronnes / 22C06 / 09 |
| 110 | La Petite Romaine | Tourbières Lambert (division Saint-Paul-du-Nord) | Tourbe de sphaignes | Iberville / 22C06 / 09 |
| 111 | Pointe-Lebel | Premier Horticulture (division Sogevex) | Tourbe de sphaignes | Manicouagan / 22F01 / 09 |
| 112 | Port-Cartier Ouest | 9006 - 1474 Québec inc. (Les Tourbières Torland) | Tourbe de sphaignes et blocs de tourbe de sphaignes | Babel / 22J02 / 09 |
| 113 | Port-Cartier Est | Tourbières Blocs Dorés | Blocs de tourbe de sphaignes | Leneuf / 22J02 / 09 |
| 114 | Ville de Sept-Îles | Les tourbes M.L. (Division tourbières Sept-Îles) | Tourbe de sphaignes | Letellier / 22I05 / 09 |
| 115 | Rivière-Moisie | Premier Horticulture (division Sept-Îles) | Tourbe de sphaignes | Moisie / 22I05 / 09 |

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